Imagine COMMUNICATIONS™

Installation and Operation Manual

Vidiem Element Management System

For Release 6.0.0

Publication Information

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Return Material Authorization

A Return Material Authorization (RMA) must be obtained prior to returning any equipment. Contact the appropriate call center (listed above) to open a ticket and obtain an RMA.

Release History and Firmware Compatibility

Table 1-1 Vidiem Element Management System and System Firmware Compatibility

Vidiem Release		Compatible System Firmware Releases	
Release Number	**Release Date**	**NetVX Firmware**	**FlexiCoder DVS Firmware**
6.0.0	06-28-12	8.6.0 to 1.0	4.1.10 to 3.7.0
5.6.0	03-16-12	8.6.0 to 1.0	4.1.10 to 3.7.0
5.3.0	12-11-09	8.3.0 to 1.0	4.1.8 to 3.7.0
5.1.0	07-01-09	8.1.0 to 1.0	4.1.8 to 3.7.0
5.0.0	04-10-09	8.0.0 to 1.0	4.1.8 to 3.7.0
4.8.0	02-06-09	7.8.0 to 1.0	4.1.8 to 3.7.0
4.7.1	12-09-08	7.8.0 to 1.0	4.1.8 to 3.7.0
4.7.0	11-04-08	7.7.0 to 1.0	4.1.8 to 3.7.0
4.6.0	07-29-08	7.6.0 to 1.0	4.1.8 to 3.7.0
4.5.0	04-28-08	7.5.0 to 1.0	4.1.8 to 3.7.0
4.4.0	03-07-08	7.4.0 to 1.0	4.1.8 to 3.7.0
4.3.0	01-09-08	7.3.0 to 1.0	4.1.8 to 3.7.0
4.2.0	09-27-07	7.2.0 to 1.0	4.1.8 to 3.7.0
4.0.0	05-14-07	7.0.0 to 1.0	4.1.8 to 3.7.0
4.0.0	10-03-06	6.7.0 to 1.0	4.1.6 to 3.7.0
3.9.0	05-30-06	6.6.0 to 1.0	4.1.6 to 3.7.0
3.8.0	01-13-06	6.5.1 to 1.0	4.1.6 to 3.7.0
3.7.0	11-04-05	6.5.0 to 1.0	4.1.6 to 3.7.0
3.6.1	08-11-05	6.1.0 to 1.0	4.1.6 to 3.7.0
3.6.0	06-21-05	6.0.0 to 1.0	4.1.6 to 3.7.0
3.5.0	03-30-05	5.8.0 to 1.0	4.1.6 to 3.7.0
3.4.0	02-09-05	5.7.0 to 1.0	4.1.6 to 3.7.0
3.3.0	08-16-04	5.6.0 to 1.0	4.1.2 to 3.7.0

3.2.0	03-22-03	5.5.0 to 1.0	4.1.2 to 3.7.0
3.1.0	12-31-03	5.2.0 to 1.0	4.1.1 to 3.7.0
3.0.0	11-31-03	5.0.0 to 1.0	4.1.0 to 3.7.0
2.3.0	06-09-03	3.1 to 1.0	4.0.1 to 3.7.0
2.2.0	02-11-03	3.0 to 1.0	4.0.1 to 3.7.0
2.1.0	11-15-02	2.0 to 1.0	3.9.2 to 3.7.0
1.3.2	07-16-03	N/A	3.9.2 to 3.7.0
1.3.0	08-28-03	N/A	3.9.0 to 3.7.0
1.2.1	01-24-02	N/A	3.8.1 to 3.7.0
1.2.0	09-06-01	N/A	3.8.0 to 3.7.0

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Volume 1: Vidiem™ Element Management System

Chapter 1: Getting Started...

Installation and Basic Configuration

1

1.1 Installation and Configuration Overview

This document provides detailed instructions to perform the following basic installation and configuration steps.

1. Install the Vidiem™ Element Management System on your PC. The Vidiem™ Element Management System runs on Windows NT/2000/XP. An administrative login is required for installation. If you do not have administrative permissions, then ask your system administrator for help with installation. "How to Install the Vidiem™ Element Management System" on page 34 describes the installation process.
2. Start the Vidiem™ Element Management System.
    - See "How to Start the Vidiem™ Element Management System" on page 35.
3. Set, or identify, the IP address of your device. Vidiem™ requires this address to communicate with your device. If you do not know your system's IP address, then follow the procedures in the appropriate sections below. TEST
    - See "How to Connect to a Device Using Windows HyperTerminal" on page 46.
    - See "FlexiCoder DVS Ethernet IP Address Procedures" on page 37.
    - See "How to Set the NetVX IP Address" on page 38.
4. Configure the Vidiem™ Element Management System to connect to your device.
    - See "How to Add a Device to the Vidiem™ Device List" on page 39.
5. Connect to your device.
    - See "How to Read a Device Configuration" on page 40.

1.2 Installation Requirements

Ensure that your PC, network, and NetVX or NetVX (device) meet the following requirements before beginning installation.

Host PC Minimum Requirements

- Windows NT 4.0 with service pack 6 loaded, Windows 2000, WIndows XP.
- 300 MHz Pentium II
- 128 MB ram
- CD-ROM
- 5 GB disk
- Ethernet
- 1024 x 768 display, 16 bits color
- 10/100 BaseT Ethernet Card

Networking Requirements

- 10/100 BaseT Ethernet (IP) connectivity between the PC controller and the device.

NetVX Requirements

- A SYS-G10 controller module must be installed and operational.
- A compatible firmware release as noted in Table 1-1, "Vidiem Element Management System and System Firmware Compatibility" on page 3.
- Be sure to review the NetVX's Product Release Description (PRD). The PRD is included on the firmware distribution release CD and provides important, last minute information concerning system operation and performance.

FlexiCoder Digital Video System Requirements

- A NIM-100 controller module must be installed and operational.
- A compatible firmware release as noted in Table 1-1, "Vidiem Element Management System and System Firmware Compatibility" on page 3.
- Be sure to review the FlexiCoder Digital Video System's Product Release Description (PRD). The PRD is included on the firmware distribution release CD and provides important, last minute information concerning system operation and performance.

Operating System Compatibility

Table 1-1 Vidiem™ SNMP and Windows Operating System Compatibility

Release Number	Windows Operating System		
	NT	XP Service Pack 1	XP Service Pack 2
3.4.0 and above	❍	❍	●
3.3.0	●	●	●[a]
3.2.0 and below	●	❍	●[b]

Legend	
Supported Feature	●
Unsupported Feature	❍

a. Requires Windows' SNMP 'Library' software. See the next section for installation instructions.
b. Requires Windows' SNMP Library' software.

1.3 How to Install Windows SNMP Library

1. Select 'Add Remove Programs' in the windows control panel.
2. Choose 'Add Windows Components'.
3. Check the 'Management and Monitoring Tools'.
4. Check the 'Simple Management Protocol'.
5. Click on 'OK' to install the SNMP windows component.

1.4 How to Install the Vidiem™ Element Management System

Note: You must have administrative privileges on your PC to install the Vidiem™ Element Management System.

1. Close any open programs.
2. Run the 'setup.exe' program from the installation CD.

```
CD DRIVE:\setup.exe
```

Note: On many systems the setup program will start automatically when the CD is inserted.

3. Follow the directions provided in the Vidiem™ Element Management System InstallShield wizard.
4. (Optional) If you are upgrading your installation you may be able to import your existing device entries from the directory in which they reside. To import device entries, continue the installation until you reach the 'Select Previous Version Import' dialog and in that dialog, select the 'Import from a Directory' option and press the 'Next' button.

5 In the 'Choose Destination Location' dialog, specify a location such as the following, where #.#.# is the previous version.

```
C:\Program Files\Harris\Vidiem\#.#.#\Data\
```

Note: Special Note for Windows XP Installations:
If the (Windows XP) firewall is enabled, it blocks unsolicited incoming traffic, including SNMP traps. This can be fixed either by turning off the Windows firewall or by creating an exception, and allowing traffic through UDP port 162.

1.5 How to do a Silent Install of the Vidiem™ Element Management System

Note: You must have administrative privileges on your PC to install the Vidiem™ Element Management System.

1 Open a command prompt.
2 Go to the directory that contains the Vidiem setup file.
3 The following parameters can be used to install silently:
- **/S** Silent Install
- **/V** Import Version
- **/D** Install Location

4 Type **Vidiem-Install-<Version Number>.exe /S /V=<version> /D=<Install Location>**
For example: **Vidiem-Install-5.5.0.exe /S /V=5.5.0 /D=C:\Program Files\Harris\Vidiem\5.5.0**
5 The installation will start up and complete in a couple of minutes.
6 When done, you will see the installed software in the specified folder.
7 For any issues, review the **install.log** file in the installation folder.

1.6 How to Start the Vidiem™ Element Management System

Abstract: *Use the steps in this section to launch the Vidiem™ Element Management System. See the following section for a discussion of user profiles and access levels.*

1 Double-click the Vidiem icon on your desk top or select:

```
Start > Programs > Harris > Vidiem #.#.#
```

2 Enter the same User Name, Password, and Domain that you use for your NT account to log on to your PC and press the 'OK' button.

1.7 Vidiem™ User Management Procedures

1.7.1 Overview of User Profiles and Access Levels

- A user with Windows NT administrative privileges is provided with the 'Supervise' access level by default.
- Only users with the 'Supervise' access level can create, modify, and delete user profiles.
- Therefore, if users that do not have Windows NT administrative privileges intend to use the Vidiem™ Element Management System, then a user with these privileges and 'Supervise' access should create a profile for each such user.
- Windows NT administrative privileges are not required for 'Supervise' access.
- The following table shows the relationship between access levels and associated Vidiem™ Element Management System activities.

Table 1-2 User Access Level and Permitted Vidiem™ Element Management System Activities

	Vidiem™ Access Level		
Activity	**View**	**Edit**	**Supervise**
View Settings	YES	YES	YES
Create and Modify Configurations	NO	YES	YES
Create and Modify User Profiles	NO	NO	YES
Create and Modify Device Profiles	NO	NO	YES

1.7.2 How to Add a New User Profile

1. From the menubar, select 'Tools > Users…'
2. Press the 'New' button to open the User Properties dialog. See the "User Properties Dialog" on page 37 for details
3. Fill in the necessary information.
4. Press the 'OK' button.

1.7.3 How to Delete an Existing User Profile

1. From the menubar, select 'Tools > Users…'
2. Highlight the user profile you want to delete.
3. Press the 'Delete' button.
4. Press the 'OK' button.

1.7.4 How to Edit a User Profile

1. From the menubar, select 'Tools > Users…'
2. Highlight the user profile you want to delete.
3. Press the 'Properties' button to open the User Properties dialog.
4. Edit the details you want to change.
5. Press the 'OK' button.

1.8 User Management Dialogs

1.8.1 Users Dialog

Users List

Lists all the user profiles.

New

Opens the User Properties dialog with a blank user profile.

Properties

Opens the User Properties dialog for the selected user profile.

Delete

Deletes the selected user profile from the user list.

Close
Closes the Users dialog.

1.8.2 User Properties Dialog

Note: This dialog requires Supervise access level permissions.
See "Login Dialog" on page 37 for a description of each access level.

Login
If accessed using the Properties button in the Vidiem™ Users dialog, then this field displays the user's login ID and is not editable.
If accessed using the New button in the Vidiem™ Users dialog, this field is blank and will accept a new user's login ID.

Full Name
Enter, view, or edit the user's full name.

Password
Enter or edit the user's password.

Password Confirmation
Confirm the user's password

1.8.3 Login Dialog

Abstract: *This dialog provides administrative security.*

Login
Enter your NT login name here. Use the same login that you use when you log onto your computer.

Password
Enter your NT password here. Use the same password that you use when you reboot your computer.

Domain
Enter the domain that your system is operating in here. This is the same domain that is shown when you log in to your computer.

1.9 FlexiCoder DVS Ethernet IP Address Procedures

1.9.1 How to Set the FlexiCoder DVS Ethernet IP Address

1 Use the following commands at the craft port interface to assign the FlexiCoder DVS an Ethernet IP address, gateway address, and subnet mask.

```
ip address ethernet <IP Address>
```

Note: The gateway address and subnet masks are required only if the PC running the Vidiem™ Element Management System and the FlexiCoder DVS are on separate subnets, or if firmware upgrade files shall be loaded from a file server on another subnet.

- Use the following command line to assign the FlexiCoder DVS an gateway IP address.
  `ip address gateway <IP Gateway Address>`
- Use the following command line to assign the FlexiCoder DVS's subnet mask.
  `ip address subnet ethernet <IP Subnet Mask>`

2 Save any changes to IP address in the system's non-volatile memory.

```
save context
```

Note: Be sure that the LAN hub you select and the PC running the Vidiem™ Element Management System software have IP connectivity to one another.

3 Use the PC's ping utility to verify Ethernet connectivity to the device. Instructions for using Window's ping utility are provided in "How to Ping a Device" on page 46.

1.9.2 How to Check the FlexiCoder DVS Ethernet IP Address

1 Establish a serial port connection with the NetVX by following the directions in "How to Connect to a Device Using Windows HyperTerminal" on page 46.

2 Press the 'Enter' key twice to bring up the following '>' command prompt.

3 Type the following to verify the system's Ethernet IP address.

```
ip address ethernet
```

The system displays its Ethernet IP address. If no address, or '0.0.0.0' is displayed, then set the address as described in the previous section.

1.10 How to Set the NetVX IP Address

Abstract: *This procedure explains how to set the NetVX's IP address using either the Front Panel or the Craft Port interface. The Vidiem™ Element Management system can not be used to set the NetVX's IP address.*

1.10.1 IP Address Configuration Using the Front Panel Interface

1 Press the **'HOME'** button.

2 Highlight 'Config' and press the **'SELECT'** button.

3 Turn the knob as needed and press the **'SELECT'** button to highlight each item in the following path.

```
cfg sys/ip/eth/ipaddr
```

4 Turn the knob as needed and press **'SELECT'** to set each segment of the IP address.

5 After values for each segment are set as desired, press the **'SELECT'** button one final time to register the IP address setting. The '<<'between the words 'IP address' and the configured address turn to '=' when the setting is complete.

6 Repeat the above steps altering only Step 3 to select and set the system's subnet mask and gateway address.

7 Turn the knob as needed and press the **'SELECT'** button to highlight each item in the following path. The new IP address, subnet and gateway settings go into effect when this step is completed.

```
util ip/update
```

1.10.2 IP Address Configuration Using the Craft Port or Telnet Interface

1 Connect a PC or UNIX terminal to the 'Craft Port' connection, or establish a Telnet session. See "How to Connect to a Device Using Windows HyperTerminal" on page 46 for details.

Note: The second command line, in each of the following instructions, should be used when configuring redundant system controllers.

2 Type the following and press 'Enter' for the system to register this IP address.

```
cfg slot.1/ip/ifc.1 ipaddr <ip address>
cfg slot.2/ip/ifc.1 ipaddr <ip address>
```

3 Type the following and press 'Enter' for the system to register this IP subnet address.

```
cfg slot.1/ip/ifc.1 ipmask <ip subnet address>
cfg slot.2/ip/ifc.1 ipmask <ip subnet address>
```

4 Type the following and press 'Enter' for the system to register this IP gateway address.

```
cfg slot.1/ip/ifc.1 ipgate <ip gateway address>
cfg slot.1/ip/ifc.2 ipgate <ip gateway address>
```

Note: If using the Telnet interface, the next step will end your session and cut off communication. You must begin a new Telnet session using the new IP address to re-establish communication.

5 Type the following and press 'Enter' to make all IP address changes simultaneously take effect.

```
util ip update
```

1.10.3 How to Verify the NetVX Ethernet IP Address

1 Establish a serial port connection or telnet session on the NetVX.

- See "How to Connect to a Device Using Windows HyperTerminal" on page 46 for details.
- See "How to Access the NetVX Using Telnet" on page 43 for details

2 Type the following to verify the system's Ethernet IP address(es)

```
cfg slot.1/ip/ifc.1 ipaddr <ip address>
cfg slot.2/ip/ifc.1 ipaddr <ip address>
```

3 (Front Panel) Turn the knob as needed and press the 'Select' button to highlight each item shown in the path above.

The system displays its Ethernet IP address. If no address, or '0.0.0.0' is displayed, then set the address as described in the previous section.

1.11 Vidiem™ Device Management Procedures

1.11.1 How to Add a Device to the Vidiem™ Device List

Abstract: *Use this dialog to register new devices within the Vidiem™ Management System.*

Note: This procedure requires Supervise access level permissions. See "Overview of User Profiles and Access Levels" on page 35 for a description of each access level.

Each entry in the device list identifies a specific FlexiCoder Digital Video System or NetVX. You must create a device profile for each device that you wish to control using the Vidiem™ Element Management System.

1 Open the 'Devices' dialog.

- Select 'Tools > Devices...' from the menubar.

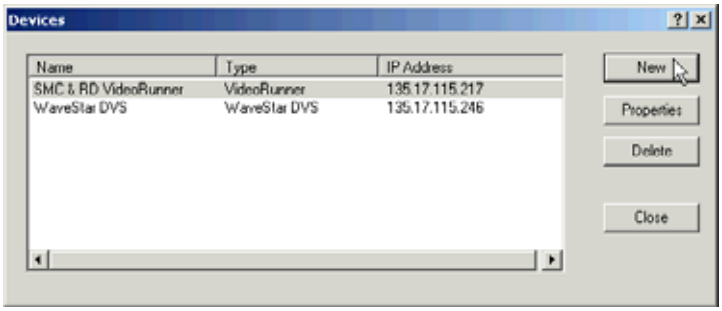

Figure 1-1 Vidiem™ Devices Dialog

2 Click the 'New' button in the 'Devices' dialog to open the 'Device Properties' dialog. You can choose to add a device of type NetVX, FlexiCoder, or Selenio.

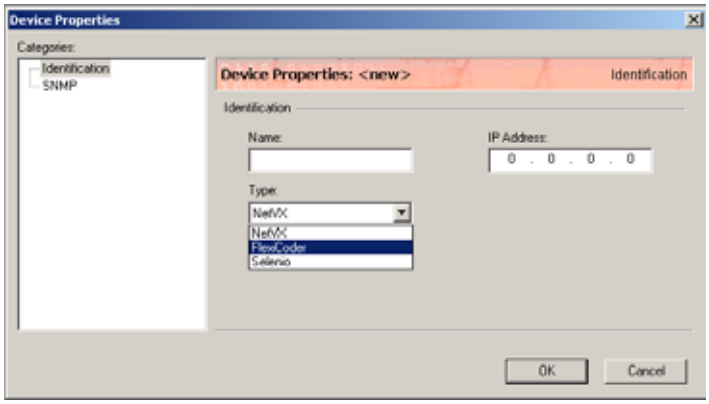

Figure 1-2 Vidiem™ Device Properties Dialog

3 Enter the 'Name' and 'IP Address' of the new device in the Device Properties dialog. See "How to Set the FlexiCoder DVS Ethernet IP Address" on page 37 or, "How to Set the NetVX IP Address" on page 38 for details.

4 Press the 'OK' button. You have now registered a device in the system.

5 Press the 'Close' button on the device dialog.

1.11.2 How to Remove a Device from the Device List

Note: This dialog requires Supervise access level permissions. See "Overview of User Profiles and Access Levels" on page 35 for a description of each access level.

1 Open the 'Devices' dialog. Select 'Tools > Devices...' from the menubar.

2 Highlight the row listing the device that you want to delete.

3 Press the 'Delete' button.

4 Press the 'Close' button.

5 The deleted device will no longer appear in the device list.

1.11.3 How to Edit a Device

Note: This dialog requires Supervise access level permissions. See "Overview of User Profiles and Access Levels" on page 35 for a description of each access level.

1 From the menubar, select: Tools > Users…

2 Highlight the row listing the device that you want to edit.

3 Press the 'Properties' button.

4 Edit the desired properties in the Device Properties Dialog. See the topic "Device Properties > Identification Dialog" on page 42 for details.

5 Press the 'Close' button.

1.11.4 How to Read a Device Configuration

Use this procedure to read system settings into the Vidiem™ Element Management System.

1 On the menu bar, select:

```
Device > Open...
```

2 In the Device Selection dialog, highlight the name of the device that you want to read and press the 'OK' button.

The Vidiem™ Element Management System attempts to connect to the selected device. A successful connection attempt results in a Vidiem™ displaying the device. An error message is provided after an unsuccessful connection attempt.

It may take several seconds to read the NetVX's settings. Progress meters are provided at the bottom of the Vidiem™ Element Management System's window.

1.11.5 How to Write Settings to a Device

After reading device settings into the Vidiem™ Element Management System, select the following from the menu bar to write settings back to the device.

```
Device > Write
```

Note: Edit or Supervise access level permissions within the Vidiem™ Element Management System are required to perform write operations.

- If the Vidiem™ Element Management System completes the write to the device without any error messages, then the Vidiem™ Element Management System software and the device firmware are compatible.
- If the write does not complete, then see "How to Ping a Device" on page 46 for help.

1.11.6 How to Create a Device Configuration File Without a Device

Abstract: *Vidiem™ can create a device configuration file even when a device to connect to is not available.*

1. Choose 'File > New' from the menu bar.
2. In the 'New' dialog, choose the type of device for which you want to create a configuration file.
3. Press the 'OK' button to create a configuration file.
4. Configure settings as desired.
5. Choose 'File > Save As' to select a network location and specify a name for the file.

Later, if you want to write this configuration to an actual system, simply open the file and select 'Device > Write'.

1.12 Device Management Dialogs

1.12.1 Devices Dialog

Abstract: *Use this dialog to add devices and edit device properties.*

Device List

Lists all registered devices.

New

Opens a blank Device Properties dialog box. Use this dialog to register new devices.

Properties

Displays the Device Properties dialog box for the selected device.

Delete

Deletes the selected item from the device list.

Close

Closes the Device Selection dialog box.

1.12.2 Device Selection Dialog

Abstract: *This dialog provides a list of all devices added to the Vidiem™ Management System.*

To open a device, highlight the desired device and select OK.

Device List
Provides a list of all registered devices.

OK
Opens the selected device in a new window.

Cancel
Dismisses this dialog and returns to the main window.

1.12.3 Device Snapshot Dialog

Abstract: *Use this dialog to capture a 'snapshot' (file) of the configuration of any number of devices appearing in the device menu.*

Devices (list)
Lists each of the devices in the device menu.

Check All/Clear All (buttons)
Selects or deselects all entries in the device list.

Directory
Indicates the current target directory for device files.

Browse
Use this button to specify the target directory for device files.

Related Procedure

See Section 3.18.3, "How to Simultaneously Save Several NetVX System Configurations (Snapshot Feature)" on page 155.

1.12.4 Device Properties > Identification Dialog

Abstract: *Use this dialog to set or edit device properties. This dialog requires Supervise Access Level permissions. See* *"Login Dialog" on page 37 *for a description of each access level.*

Identity

Name
Indicates the name of the selected 'Device' profile.

IP Address
Assigns an IP address to the selected device profile.

Type
Identifies the system type for this device entry.

1.12.5 Device Properties > SNMP Dialog

Abstract: *Use this dialog to configure SNMP communication settings.*

Name

Indicates the name of the selected 'Device' profile.

Device Communication

Community String

Use this control to enter the SNMP community string. See "Overview of the SNMP Community String" on page 45 for details.

Retries

Sets the number of times the Vidiem™ Management System will try to reach the selected device following the failure of an initial attempt.

SNMP Timeout

This control sets the timeout (or wait) period before the next SNMP connection attempt.

Status Retrieval

The following selections affect the interval between which Vidiem (using SNMP) polls devices.

System Default Choose this option to set the polling interval to the default specified in "Tools > Preferences > Default SNMP Communication Values Dialog" on page 55.

Fixed Interval Choose this option to specify a polling interval between 1 and 3600 seconds.

1.12.6 Device Properties > Members

Note: This dialog pertains to features destined for a future release.

Cluster Membership

Members

This list presents each of the systems listed in the Device Manager.

1.13 How to Access the NetVX Using Telnet

Abstract: *The NetVX provides a Telnet interface for basic system configuration. This interface is nearly identical to the craft port interface.*

1.13.1 Prerequisites

- The NetVX must be configured with an IP address. See the topic "How to Set the NetVX IP Address" on page 38 for instructions.
- The PC or UNIX terminal/workstation used to run telnet must have IP connectivity (usually over Ethernet) to the NetVX.
- You must know the password of your NetVX. The system is shipped with the default password 'admin'. See "System Password Procedures" on page 170 for details.

Note: Telnet and any other 'state-dependent' TCP connections are closed when a system controller module fails over to its backup module. Following a failover, the Telnet session may be re-initialized using the same IP address.

1.13.2 Telnet Access Using a Windows PC

1 Press the 'Start' button.

2 Select ‘Run…’
3 In the ‘Open’ box, type ‘telnet <IP address>’. Use the IP address of the NetVX's System Controller module.
4 Press the ‘OK’ button.
5 Use ‘Admin’ as the login when prompted.
6 Enter the case-sensitive password at the prompt and press ‘Enter’.

1.13.3 Telnet Access Using a UNIX Terminal or Workstation

1 Type ‘telnet <IP address>’ in the ‘Open:’ box provided. <IP address> is the IP address of the NetVX's System Controller module.
2 Use ‘Admin’ as the login when prompted.
3 Enter the case-sensitive password at the prompt and press ‘Enter’.

1.13.4 If Vidiem™ Can Not Read a Device...

Use these steps if the Vidiem™ Element Management System does not successfully read from or write to the NetVX then check the following items.

1 Try to ping the device (described in the next section). If ping fails...
- Check that the system’s IP address is set correctly.
- Verify that the Ethernet linking the system and the PC are in working order.

2 Check that the version of the Vidiem™ Element Management System software you are running is compatible with the system’s firmware version. The version number is displayed in the ‘About’ box, and is available by selecting...

```
Help > About
```

Note: When incompatible versions of software and firmware cause a read error, it is typically due to a system running a newer version of firmware than is supported by the Vidiem™ Element Management System.

- To check the NetVX’s firmware version, open a craft port connection to the system and use the ‘ident’ command to display (among other things) the system’s ‘firmware release level’.

```
ident
```

- To check the NetVX Video Networking System’s firmware version, open a craft port connection to the system and use the ‘version’ command.

```
stat sys/gen version
```

3 Use "Vidiem Element Management System and System Firmware Compatibility" on page 3 to determine whether the Vidiem™ Element Management System software and NetVX, or NetVX firmware is compatible.
If the firmware and software versions are not compatible, upgrade the appropriate component as necessary.

1.14 Configuration File Management Procedures

1.14.1 New File Dialog

Abstract: *Use this dialog to select the type of configuration file that you want to create.*

1 Highlight ‘FlexiCoder DVS’ to create FlexiCoder DVS configuration file.
or
Highlight ‘NetVX’ to create a NetVX configuration file.
2 Press OK to create the file.

Note: Be sure to save the file following any changes. Use ‘File > Save’ to save the file on the file system.

1.14.2 How to Save a System Configuration to a File

Abstract: *Use this procedure to save a system configuration to a file.*

1. Choose 'File > Save As' to select a network location and specify a name for the file.
   or
2. If the file has already been named, simply choose 'File > Save' to save the file.

1.14.3 How to Copy System Configurations Between Files and Devices

Abstract: *Use this procedure to copy a configuration from one device or file to another device.*

1. Make the Vidiem™ Management System display the configuration that you want to copy.
   If the configuration you want to copy is in a file, then select 'File > Open' and skip to step 5.
   or
   If the configuration you want to copy is on another device, select 'Device > Open' and open that device.
2. Select 'File > Save As'. Give the configuration a file name and save it to a location.
3. Select 'File > Close'.
4. Select 'File > Open' and open the file you created in Step 2. At this point, the file is no longer associated with a device.
5. Select 'Device > Write' and select the device you wish to target. The Vidiem™ Management System will write the configuration to the selected device.

1.15 Overview of the SNMP Community String

The community string provides a mild form of security for SNMP communications. The SNMP community string requires identical strings on both the NetVX and in the respective Vidiem™ Element Management System's 'Device Profile' in order permit SNMP communication.

The community string is configured in the NetVX using the craft port, the telnet, the front panel, or the HTTP interface. The community string that resides on the NetVX cannot be configured remotely using SNMP interfaces such as the Vidiem™ Element Management System or SNMP-based machine control.

In the Vidiem™ Element Management System, the community string is configured in the 'Device Profile' dialog. If desired, a unique community string could be configured for each device.

Note: The community string entered in the 'Device Profile' dialog simply associates a string with a device, it does not write or change the string residing on the device.

Whenever the NetVX receives an SNMP message, it compares it's community string with the community string contained in the message. If the two strings match, the message is received and processed. If the two strings do not match, the message is dropped.

Related Topics

"Device Properties > Identification Dialog" on page 42.

1.16 Reference Procedures

Abstract: *This section provides supplementary procedures that may be helpful for carrying out previously mentioned steps.*

1.16.1 How to Connect to a Device Using Windows HyperTerminal

A terminal connection is required to assign an IP address to your device. Use this procedure to create a terminal connection to either the NetVX or the NetVX.

1. Locate the RS-232 connection on the PC. This connection is usually labeled 'COM1' or 'COM2'.
2. Locate the craft port connection on the device.
   - On FlexiCoder DVS systems, locate the connection labeled 'RS-232' on the NIM-100 controller's I/O module.
   - On NetVX systems, locate the connection labeled 'Craft Port' on the rear of the chassis.
3. Connect the PC and the device's craft port using a standard RS-232 cable. DO NOT use a null modem cable.
4. Open Windows' HyperTerminal application:
   - On Windows NT systems select,
     'Start > Programs > Accessories > HyperTerminal > HyperTerminal'
   - On Windows XP and 2000 Systems select,
     'Start > Programs > Accessories > Communications > HyperTerminal'
5. Enter a name for the new connection in the HyperTerminal's 'Connection Description' window.
6. Highlight an icon in the row of icons, and click the 'OK' button. The system opens the 'Phone Number' pop-up window.
7. From the 'Connect Using' drop down, select the number of the PC's COM port that is connected to the device.
8. Click the 'OK' button. The system opens the 'COM 1 (or 2) Properties' pop-up window.
9. Set the following in the 'COM 1 (or 2) Properties' pop-up window.
   - For FlexiCoder DVSs, set the 'Bits per Second' to '19200'.
   - For NetVX systems, set the 'Bits per Second' to '9600'.
   - Set 'Data Bits' to '8'.
   - Set the 'Parity' to 'None'.
   - Set 'Stop Bits' to '1'.
   - Set 'Flow Control' to 'None'.
10. Click the 'OK' button.
11. Choose 'File > Save As...'.
12. Enter a name to save the session file (<name>.ht) for future use.
13. Double click the connection icon to start a HyperTerminal connection.
14. (FlexiCoder DVS only) Press the enter key twice to bring up the FlexiCoder DVS '>' command prompt.

1.16.2 How to Ping a Device

Abstract: *The Ping utility verifies IP communication. Use the following steps to attempt to ping the device from the PC hosting the Vidiem™ Element Management System.*

1. Select the following and press 'Enter'.

```
Start > Run...
```

2 Type ‘command’ in the ‘Run’ dialog and press the ‘OK’ button to open to the MS-DOS command prompt.

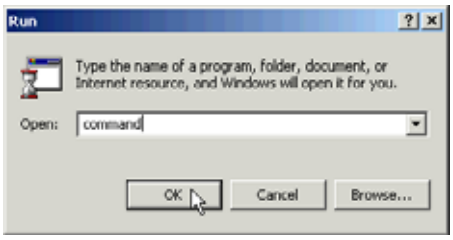

Figure 1-3 Windows ‘Run’ dialog Box

3 Type the following in the MS-DOS dialog:

ping <device ip address>

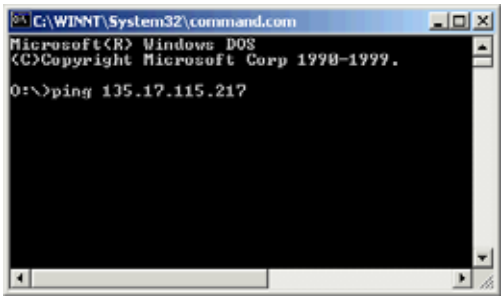

Figure 1-4 Ping Command

4 Press ‘Enter’. You’ll see a screen similar to the one on the left below if the ping attempt was successful. You’ll see a screen similar to the one on the right if the ping attempt was unsuccessful.

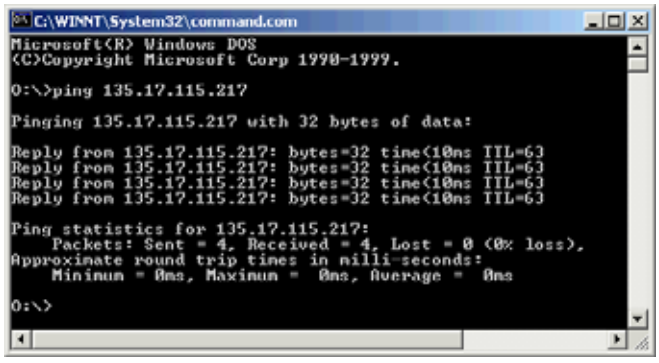

Figure 1-5 Successful (left) and Unsuccessful (right) Attempts to Ping a Device

5 If the ping attempt was unsuccessful, check all IP addresses, and Ethernet wiring between the PC and the device.

Chapter 2: Vidiem™ Overview 2

2.1 Overview of the Vidiem™ Main Window

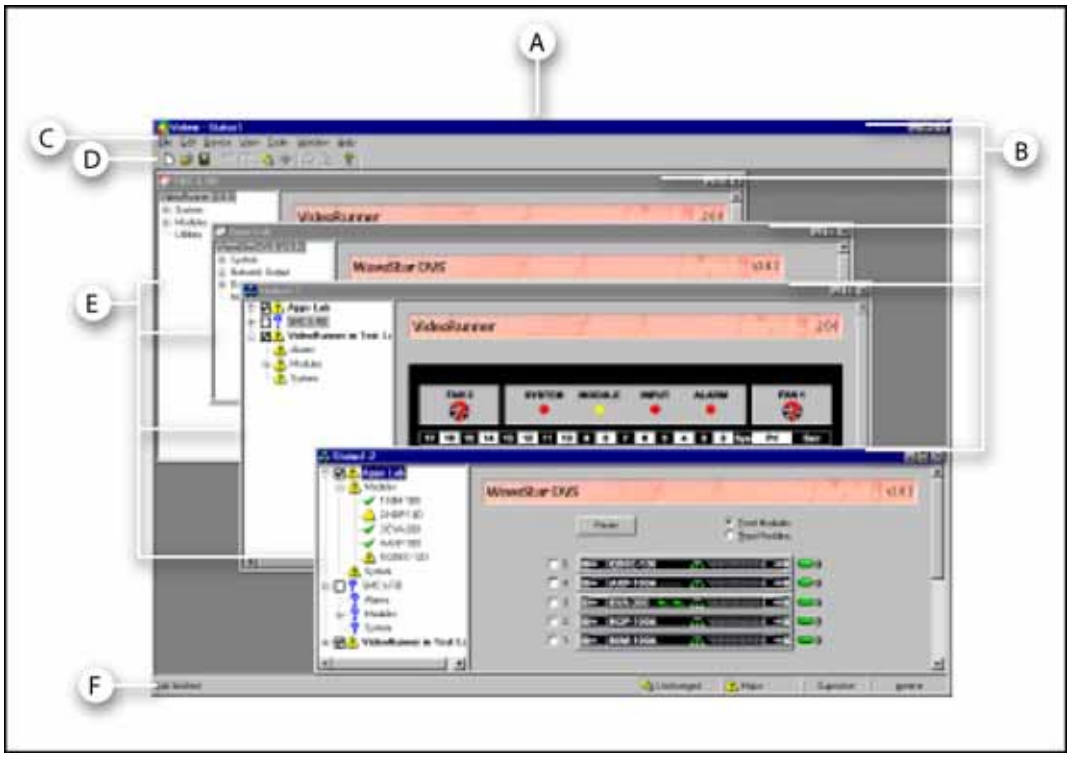

Figure 2-1 Main Document Window

The main document window (A) presents a shell with the following elements.

B Title Bars See "Vidiem™ Title Bars" on page 50 for descriptions of each type of title bar.

C Menu Bar See "Menu Bar" on page 51.

D Tool Bar A Tool Bar provides quick access to a handful of menu bar combinations and other functions. Use the menu bar and tool bar options to open and interact with Vidiem™ document windows. See "Tool Bar" on page 54.

E Document Windows Vidiem™ supports multiple document windows. Therefore you can open a window for each system that you wish to control, or you can open more than one window to look at different aspects of the same system. Each document window also has its own navigation tree.

F Status Bar The Status Bar provides indicators of various devices and Vidiem™ status. See "Status Bar" on page 54 for details.

2.1.1 Vidiem™ Title Bars

Vidiem™ Application Window

Figure 2-2 Main Application Window Title Bar

Vidiem™'s application title bar displays the application name followed by a dash and the title bar text of the document window currently with focus.

Device in Document Window

Figure 2-3 Device Document in Window Title Bar

This title bar indicates the document window displays a configuration read from a device. The device name is listed in the title bar. This title bar text is the result of selecting either 'Device > Read', or 'Device > Open'.

Unsaved Configuration File in Document Window

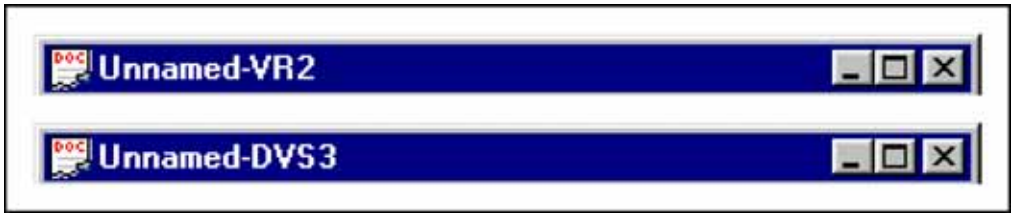

Figure 2-4 Unsaved Configuration File in Document Window Title Bar

These title bars indicate a document window displaying an unsaved configuration. The 'VR#' or 'FlexiCoder DVS' on the end of the title bar text distinguishes the device type. This title bar text is the result of creating a new file by choosing 'File > New' from the menu bar, and selecting a device.

Configuration File Document Window

Figure 2-5 Configuration File in Document Window Title Bar

This title bar indicates the document window displays a configuration file that is not associated with a device. The 'File > Save As' operation prompts for a file name. A 'vr' extension indicates a NetVX configuration file. A 'dvs' extension indicates a FlexiCoder DVS configuration file.

Device and Configuration File Document Window

Figure 2-6 Device and Saved Configuration in Document Window

This title bar indicates the document window displays a device configuration associated with a named configuration file. This title bar text indicates that either a configuration was read from a configuration file and saved to a device, or read from a device and saved to a configuration file.

Status Document Window

Figure 2-7 Status Display in Document Window

This title bar indicates that the document window contains a status display.

2.1.2 Menu Bar

Figure 2-8 Vidiem™ Menu Bar

File Menu

*New**	Opens the 'New' dialog. This dialog prompts you to choose the type of system to associate with this file. System type options are FlexiCoder DVS, and NetVX.
Open	Opens a device configuration file.
Close	Closes the current device configuration file.
Save	Saves the current device configuration file.
Save As	Saves the current device configuration to a file.
Print Setup...	Windows printer setup.
Print Preview	Presents a print preview.
Print	Prints a snapshot of the pane displayed on the right side of the screen.
(file list)	Lists recent files.
Exit	Exits the program.

Edit Menu

Undo	Reverts back to before the last action.
Redo	Re-performs the last action.
Cut	Cuts the selection.
Copy	Copies the selection to the Windows clipboard.
Paste	Pastes the selection to the Windows clipboard
Delete	Deletes the selection (if possible).
Activate	Activates the selected AUD-D14 audio encoder or decoder channel.
Deactivate	Deactivates the selected AUD-D14 audio encoder or decoder channel.
Remove Association	Removes the association between an AUD-D14 audio channel and an encoder or decoder.
Properties	Open the dialog associated with the selected object.

Device Menu

Open…	Opens a connection to the targeted device and reads the current state.
Snapshot…	Opens the Device Snapshot window. See See Section 3.18.3, "How to Simultaneously Save Several NetVX System Configurations (Snapshot Feature)" on page 155 for instructions on how to use this feature.
Read	Reads configuration and status of the selected device.
Write	Writes the configuration shown in the Document Window to the associated device.
Stop	Halts the read/write device update activity.
Save	(FlexiCoder DVS only) Saves the current configuration to the system's flash memory.
Utilities	(VR only) Opens the System Utilities window.

View Menu

Toolbar	Toggles the Tool Bar display.
Status Bar	Toggles the Status Bar display.
Collapse All	Collapses any nested table rows displayed on the right side of the screen.
Expand All	Expands any nested table rows displayed on the right side of the screen.
Status	Open a status document window.
Configuration	Indicates a configuration document window is displayed.

Tools Menu

Login	Opens the Login screen to login as a different user.
View	Changes the current user's permission level for this session to read only.
Edit	Changes the current user's permission level for this session to edit. If this permission level exceeds the user's current level, Vidiem™ prompts the user to login.
Supervise	Changes the current user's permission level for this session to supervise. If this permission level exceeds the user's current level, Vidiem™ prompts the user to login.
Users	Opens the Users Dialog for user administration. Access to this dialog requires Supervise level login authorization.
Devices	Opens the Devices Dialog for device administration. Access to this dialog requires Supervise level login authorization.
Preferences	Provides access the Vidiem™'s preferences dialogs.
BISS Keys	Opens the BISS Keys dialog which is used to manage BISS keys and settings.
Trap Log	Opens the system's Trap Log.

Window Menu

New Window	Opens a duplicate of the current configuration or status window.
Cascade	Cascades all open device configuration windows.
Tile	Tiles all open device configuration windows.
Arrange Icons	Arranges icons for all minimized windows across the bottom of the screen.

Help Menu

Topics	Opens this help system.
About	Displays the 'About Vidiem™'dialog indicating application version number, build number, and hardware and firmware compatibility.

2.1.3 Vidiem™ Document Windows

Each Vidiem™ document window presents either a configuration display or a status display of a device. Vidiem™ lets you open multiple document windows simultaneously.

For example, while configuring or monitoring a device, you can choose 'Window > New Window' from the menu bar to open another window containing another display of the same device. Repeat this procedure to open as many windows as desired. Each window display is independent so you can use each to navigate to a different location in the configuration or the status tree. The example below shows a NetVX configuration dialog.

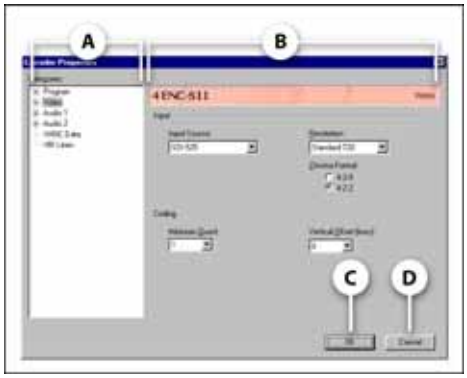

Figure 2-9 A Typical Vidiem™ Dialog

The left side (A) of each configuration dialog presents an expandable tree view. This tree is an extension of the main navigation tree and provides access to individual configuration controls.

The right side (B) of the dialog presents configuration controls. These controls provide the only way to edit device settings.

OK (button)

Press the 'OK' button (C) at the bottom each configuration dialog to cause Vidiem™ to save any changes and dismiss the dialog. After making changes, always be sure to select 'Device > Write' from the menu bar or press the 'Write' button (icon with a blue pencil and a yellow star) in the tool bar menu to write changes to the device. When working with a file, choose 'File > Save' to save changes. See "Tool Bar" on page 54 for read/write icon descriptions.

Cancel (button)

Press the 'Cancel' button (D) to dismiss the dialog without making changes to the device.

2.1.4 Tool Bar

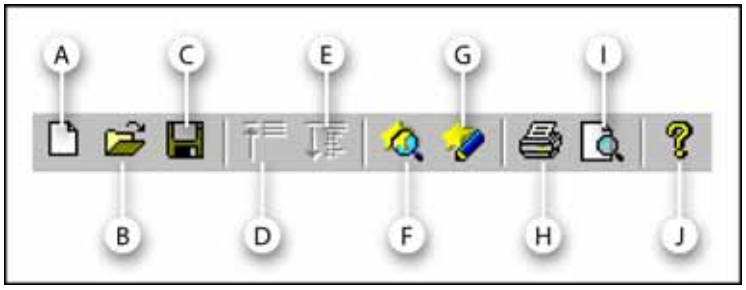

Figure 2-10 Vidiem™ Tool Bar

A New Document Icon Click this icon to create a new document; same as pressing Ctrl+N, or selecting 'File > New' from the menu bar.

B Open File Icon Click this icon to open and existing file; same as pressing 'Ctrl+O', or selecting 'File > Open' from the menu bar.

C Save File Icon Click this icon to save a configuration (to a) file; same as pressing 'Ctrl+S', or selecting 'File > Save' from the menu bar.

D Collapse Icon Click this icon to fully collapse any nested table rows displayed on the right side of the screen.

E Expand Icon Click this icon to fully expand any nested table rows displayed on the right side of the screen.

F Read Device Icon Click this icon to read settings from a device. You are prompted to select a device to read if you have only a configuration file open. Vidiem™ overwrites settings displayed in the configuration file with settings read from the device.

G Write Device Icon Click this icon to write current settings to a device. Vidiem™ prompts you to select a device to write to if only a configuration file is open. This button only becomes active when changes made in Vidiem™ have not been written to the system.

H Print Icon Click this icon to print settings displayed in the configuration table.

I Print Preview Icon Click this icon to view a print preview.

J Help Icon Click this icon for help.

2.1.5 Status Bar

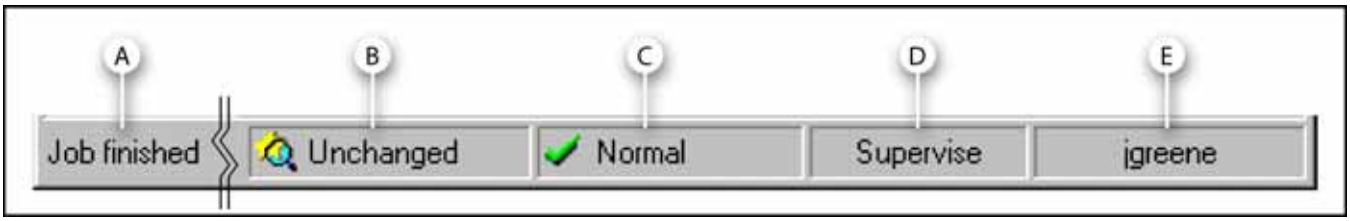

Figure 2-11 Vidiem™ Status Bar

The status bar indicates the following.

A The message display indicates communication status. 'Job Finished' indicates a completed communication to or from a device.

B The 'Changed' or 'Unchanged' status box indicates if there are any differences between the parameter settings shown in Vidiem™ and those that were last read from the selected device or file.

C The alarm status box indicates the most severe alarm on any of the systems that Vidiem™ is configured to monitor. 'Normal' indicates that none of these systems have reported a current alarm condition.

D Indicates the current user's Permission Level.

E Indicates the name of the current Windows user logged into Vidiem™.

2.2 Preferences Dialogs

Abstract: *These dialogs are accessed through the menubar by selecting 'Tools > Preferences'.*

2.2.1 Tools > Preferences > Default SNMP Communication Values Dialog

Abstract: *Use the controls in this dialog to set the default SNMP values used hen a new device profile is created.*

To change these settings in an *existing* device profile, choose 'Tools > Devices', then highlight the desired device, and press the 'Properties' button.

Device Communication

Retries
Sets the number of times the Vidiem™ Management System will try to reach the selected device following the failure of an initial attempt.

Timeout (1/100 sec)
Specify the time-out value for each SNMP communication attempt.

Confirm Device Reads
Check this box if you would prefer Vidiem™ to present a confirmation dialog before it reads information from a system.

Confirm Device Writes
Check this box if you would prefer Vidiem™ to present a confirmation dialog before it writes information to a system.

Status Retrieval

Polling Interval (sec)
Use this control to specify a polling interval between 1 and 3600 seconds. The interval specified serves as the default for any new devices that are created. Devices that are configured to use the 'System Default' Status Polling Interval use this value as well.

2.2.2 Tools > Preferences > File Properties for Trap Logging Dialog

Trap Log

Directory
Use this field to specify the location to place trap log files.

Number of Files
Specify the maximum number of trap log files the system should allow in this field. Once this number is reached, and a new file is created and the oldest file is deleted. You can specify up to 1,000 files.

Individual File Size
Specify the maximum file size for each trap log file in this field. Files can be up to 1000 KB (1 megabyte).

Enable Configuration Log

Place a check in this box to enable configuration logging. If this box is checked, then a device, date, and time-stamped configuration file is created and written to this directory each time a configuration change is written to a system.

Directory
Use this field to specify the location to place configuration log files.

2.3 Overview of BISS Scrambling

Abstract: *This section describes the NetVX's approach to BISS scrambling.*

A complete description of BISS and BISS-E is outside the scope of this document. The NetVX supports BISS-E scrambling in accordance with EBU Technical Specification 3292 rev.2, which can be downloaded from the EBU web site at:
http://www.ebu.ch/CMSimages/en/tec_doc_t3292_tcm6-10493.pdf?display=EN

The Vidiem™ Element Management System provides the following mechanisms to specify parameters related to BISS scrambling.

- The Vidiem™ Element Management System provides a means to specify the BISS Mode, the Session Word (encrypted or otherwise) and an Injected Identifier on the decoder. These fields are provided in the Descrambling pane of the Decoder Properties dialog. See Section 9 "NetVX Encoder Module" on page 261
- The Vidiem™ Element Management System provides a means to specify the encoder's BISS Session Word. This fields is provided in the Scrambling pane of the Encoder Properties dialog. See Section 10 "NetVX Decoder Module" on page 302
- The Vidiem™ Element Management System provides the 'BISS Keys' dialog as a mechanism to manage each possible pairing of BISS 'Session Word', on the encoder and 'Injected Identifier' on the decoder. See Section 2 "Vidiem™ Overview" on page 56

Related Topics

- "BISS Scrambling Dialogs" on page 56.
- "How to Configure Encoders for BISS Scrambling" on page 162.
- "How to Configure Decoders for BISS Descrambling" on page 164.
- "How to Use the BISS Keys Dialog to View Encrypted Session Words" on page 165.
- "Config > Encoder > Program > Scrambling Dialog" on page 261.
- "Config > Decoder > Program > Descrambling Dialog" on page 302.
- "Config > Decoder > Program > Descrambling Injected Identifier Dialog" on page 303.

2.4 BISS Scrambling Dialogs

2.4.1 Tools > BISS Keys Dialog

Abstract: *BISS keys are featured only on the NetVX's encoder and decode modules. BISS keys are not a feature of the FlexiCoder DVS. Use this dialog to manage the Encrypted Session word(s) used by each encoder (scrambler) and decoder combination.*

Note: Supervise-level permissions are required to make changes to the entries in this dialog.

Scrambler

Use this drop down to select a 'Scrambler'. The 'Scrambler' selection sets the context for the 'Descramblers' table. The 'Descramblers' table displays the 'Encrypted Session Word' that it associates with each decoder.

New (button)

Click this button to open the 'BISS Descrambler' dialog and to add or edit a 'Descrambler' entry.

Properties (button)

Highlight a 'Descrambler' entry and click this button to change setting associated with the entry.

Delete (button)

Highlight a 'Descrambler' entry and click this button to delete it.

Print (button)

Click this button to print the table of all 'Descrambler' settings.

Save As (button)
Click this button to save the 'Device Name' and 'Encrypted Session Word' settings table to a text file.

Close (button)
Dismisses this dialog box.

Related Topics

- "Overview of BISS Scrambling" on page 56.
- "BISS Scrambling Dialogs" on page 56.
- "How to Configure Encoders for BISS Scrambling" on page 162.
- "How to Configure Decoders for BISS Descrambling" on page 164.
- "How to Use the BISS Keys Dialog to View Encrypted Session Words" on page 165.
- "Config > Encoder > Program > Scrambling Dialog" on page 261.
- "Config > Decoder > Program > Descrambling Dialog" on page 302.
- "Config > Decoder > Program > Descrambling Injected Identifier Dialog" on page 303.

2.4.2 Tools > BISS Keys > New (button) > BISS Descrambler Dialog

Abstract: *Use this dialog to enter, and name, an injected identifier. Once entered, this identifier can easily be applied to a number of decoders.*

Name
Use this field to enter a name for this Injected Identifier entry. Note that this name string cannot be altered once the entry is created.

Injected Identifier
Use this field to enter a decoder Injected Identifier.

New (button)
Press this button to cause Vidiem™ to generate a new injected identifier.

Related Topics

- "Overview of BISS Scrambling" on page 56.
- "BISS Scrambling Dialogs" on page 56.
- "How to Configure Encoders for BISS Scrambling" on page 162.
- "How to Configure Decoders for BISS Descrambling" on page 164.
- "How to Use the BISS Keys Dialog to View Encrypted Session Words" on page 165.
- "Config > Encoder > Program > Scrambling Dialog" on page 261.
- "Config > Decoder > Program > Descrambling Dialog" on page 302.
- "Config > Decoder > Program > Descrambling Injected Identifier Dialog" on page 303.

2.4.3 Tools > Carousel > Carousel Builder

Note: See the topic "How to Use the Carousel Builder to Create Carousel Files" on page 122 for a complete description on how to use this dialog.

Related Topics

"How to Use the Carousel Builder to Create Carousel Files" on page 122.
"Tools > Carousel > Carousel Loader" on page 58.
"How to Use the Carousel Loader to Load Carousel Files" on page 122.
"How to Configure Carousel Directories and Files" on page 125.
"How to Enable the Data Carousel for Operation" on page 127.

2.4.4 Tools > Carousel > Carousel Loader

Note: See the topic "How to Use the Carousel Loader to Load Carousel Files" on page 122 for a complete description on how to use this dialog.

Related Topics

"Tools > Carousel > Carousel Builder" on page 58.
"How to Use the Carousel Builder to Create Carousel Files" on page 122.
"How to Use the Carousel Loader to Load Carousel Files" on page 122.
"How to Configure Carousel Directories and Files" on page 125.
"How to Enable the Data Carousel for Operation" on page 127

2.5 Vidiem™ Trap Log and SNMP Communication

2.5.1 Trap Log Dialog

Abstract: *This screen provides real-time monitoring of FlexiCoder DVS and NetVX SNMP traps.*

Click on any trap message displayed in the trap log to open an HTML trap description page in your PC's default browser. Each trap description page provides details about a particular trap event and type.

Selection

Current Log (radiobutton)
The trap log displays only current trap events.

History Log (radiobutton)
The trap log displays only acknowledged trap events.

Trap List
Provides a list of traps received.

Bottom Buttons

Delete Old (button)
Use with care. Vidiem can be configured to create log files of a user-specified size (See See Section 2.2.2, "Tools > Preferences > File Properties for Trap Logging Dialog" on page 55 for more information on this feature.) Press this button to delete these log files.

Acknowledge (button)
This button is displayed only in the 'Current Log'. Press this button to moves highlighted traps to the 'History Log'.

Delete (button)
This button is displayed only in the 'History Log'. Press this button to permanently delete highlighted traps from the 'History Log'.

Save (button)
Save the displayed trap list to a text file.

Print (button)
Prints the trap list.

Close (button)
Closes the trap Log.

2.5.2 Trap Log Filter Dialog

Abstract: *Use this dialog to isolate desired Trap Log entries by time and by IP Address.*

Start Date Local Time
Check this box to specify a range start time later than "12:00:00 AM 1/1/1970". If left unchecked, this value is used by default.

End Date, Local Time
Check this box to specify a range end time earlier than the current date and time. If left unchecked, the current date and time is used by default.

IP Address
Check this box to isolate traps by their device or IP origin.

Related Topics
See "Trap Log Procedures" on page 161.

2.5.3 Help > About Vidiem™

Abstract: *This dialog lists the release number, and the build number. You may be asked to reference this information when calling technical support.*

The tree in the Supporting Products pane indicates all devices and device firmware versions with which the Vidiem™ is compatible.

2.5.4 Vidiem™ > References

General References

- ISO/IEC 13818 Information Technology Generic coding of moving pictures and associated audio information – This document, and ensuing updates, form the MPEG-2 standard.
- FlexiCoder DVS – Installation and Operation Manual – User manual and Product Release Description (PRD) published by the Harris Corporation and provided on each FlexiCoder DVS software distribution CD.
- NetVX Video Networking System – User manual and Product Release Description (PRD) published by the Harris Corporation and provided on each NetVX software distribution CD.
- IPMI Platform Event Trap Format Specification v1.0, December 7, 1998
- EIA-608-A
- SCTE DVS/053
- DVB A038
- ETSI EN 300472
- ETSI EN 301 775 v.1.1.1
- ISO 639-2 Codes for the representation of names of languages-- Part 2: alpha-3 code (http://www.loc.gov/standards/iso639-2)
- BISS Encryption – EBU Technical Specification Tech 3292 (rev. 2, August 2002), BISS-E, Basic Interoperable Scrambling System with Encrypted Keys

Society of Motion Picture and Television Engineers (SMPTE) Standards – http://www.smpte.org

- SMPTE 12M – Time Code and Control
- SMPTE RP165 – Error Detection Checkwords and Status Flags for Use in Bit-Serial Digital Interfaces for Television
- SMPTE 259M – 10-Bit 4:2:2 Component and 4fsc Composite Digital Signals – Serial Digital Interface
- SMPTE 266M-1994 – 4:2:2 Digital Component Systems -- Digital Vertical Interval Time Code
- SMPTE 291M – Ancillary Data Packet and Space Formatting
- SMPTE 292M – Bit-Serial Digital Interface for High-Definition Television Systems
- SMPTE 302M – Mapping of AES3 Data into an MPEG-2 Transport Stream

SONET Networking

- Understanding SONET/SDH – Standards and Applications; Ming-Chwan Chow, ISBN: 0-9650448-2-3

Advanced Television Systems Committee (ATSC) – http://www.atsc.org

- ATSC A/53 – ATSC Digital Television Standard
- ATSC A/65 – Program and System Information Protocol for Terrestrial Broadcast and Cable

PCI Standards – http://www.picmg.org

These standards are applicable only to the NetVX

- PICMG 2.0, Compact PCI Core Specification R3.0
- PICMG 2.1 Hot Swap Specification R1.0
- PICMG 2.9 System Management Bus, Draft

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Chapter 3: NetVX Configuration Procedures 3

3.1 Introduction

Most procedures for configuring the NetVX Video Networking System using the Vidiem™ Element Management System are provided in this chapter. However two other chapters provide configuration information as well.

- The chapter: "Getting Started..." on page 33 provides information on serial port and basic IP address configuration.
- The chapter: "Appendix B: NetVX Firmware Upgrade Procedure" on page 631 provides information on upgrade-related procedures.

3.2 Basic Configuration Procedures

3.2.1 How to Add a Module to a System Configuration

Abstract: *Use this procedure whenever a module is installed in a system, or needs to be added to a system configuration file.*

1. Install the module and use the appropriate step below to update the system configuration in Vidiem™.
   - If you are working with a live system, select 'Device > Read' to read the system's current configuration.
   - If you are working with a configuration file, then you can begin with the following step.
2. Click on 'Modules' in the configuration tree. Vidiem™ displays a table with a column representing each slot in the system.
3. Double-click anywhere in the column representing the desired slot. Vidiem™ opens the 'Module Properties' dialog.
4. Choose the appropriate model under 'Select Module Type'.
5. Click the 'Enable for Operation' checkbox.
6. Click 'OK' to dismiss the dialog.
7. Save the changes you have made.
   - On a live system, select 'Device > Write…' to write these changes to the system.
   - In a configuration file, select 'File > Save As...' to save these changes.

3.2.2 How to Encode Material Using MPEG-2

Abstract: *This procedure outlines the basic steps required to configure the NetVX's MPEG-2 encoders. NetVX encoders offer a wide variety of broadcast-quality configuration parameters.*

Prerequisites

Install the module using the procedure described in "How to Add a Module to a System Configuration" on page 64.

Procedure

1. Expand the 'Modules' branch of the configuration tree.
2. Expand the 'Encoders' branch.
3. Double-click the desired encoder. Vidiem™ opens the 'Encoder Properties' dialog.
4. Configure the properties associated with video input.
   - Click on 'Video' in the sub-navigation tree.
   - Select an 'Input Source' from the drop down.
   - Select a 'Resolution' from the drop down.
   - Select a 'Chroma Format'.
   - Specify any other video properties as desired.
5. Configure the properties associated with the encoder's audio inputs.
   - Click on 'Audio 1' in the sub-navigation tree.
   - Use either the 'Separate Audio Input' or the 'Embedded Audio Input' to identify the source providing the audio signal to the MPEG-2 stream's 'Audio 1'.
   - Specify the audio compression standard (or lack thereof e.g. external Compression, SMPTE-302M).
   - Specify the bit rate – if applicable.
   - Specify any other audio properties as desired.
   - Repeat the above steps for each audio stream in the program.
6. Select 'Device > Write…' to write these changes to the system.

Related Procedures

Once the module is configured and encoding MPEG-2 video, up to 8 copies of its stream can be directed (multicast) to different application modules. Each multicast stream acts independently and can perform a different function.

Decoding Procedure – A stream can be directed to a decoder in the same NetVX chassis to act as a confidence monitor. See "How to Decode MPEG-2 Material" on page 65.

Networking Procedure – The stream can be directed to an ATM or IP network interface card for network transmission. See "How to Send Video Over an ATM Connection" on page 82.

Multiplexing Procedure – The stream can be combined with other MPEG-2 streams into an ASI or 310M multiplex. See "How to Multiplex VCs into an MPTS for Tx Output" on page 97.

Note: Statistical multiplexing (below) dynamically modifies the MPEG-2 program's video bit rate. Therefore an encoder that is part of a stat-mux group should not be used in any of the above functions.

Statistical Multiplexing – The stream can have it's rate dynamically controlled, so that when it is combined into a multiplex with streams from other encoders on the same system, they can share bandwidth. See "How To Configure StatMux for Locally-Encoded Programs" on page 104.

3.2.3 How to Decode MPEG-2 Material

Abstract: *Use this procedure to direct a video source to a decoder.*

Prerequisites

Install the module using the procedure described in "How to Add a Module to a System Configuration" on page 64.

Procedure

1. Configure a video source. The source may be a local or remote. Local sources are cards, such as encoders, located in the same shelf. Remote sources are video feeds that originate elsewhere and are brought in to the system through another interface such and a Gigabit Ethernet, ATM, ASI, or 310M.
2. Install the decoder module.
3. Wire the desired decoder's output to monitor or video receiving equipment.
4. Configure the video output interface to match the format used in the used in the step above.
5. Configure the audio output format.
6. Create a cross connection from a video source to the decoder. In the configuration tree, simply click and drag the video source to the decoder and release.
7. Select 'Device > Write…' to write these changes to the system.

Related Procedures

"How to Configure a Standalone Audio Decoding Channel" on page 76.

3.3 ENC: Closed Captions and Related Procedures

Abstract: *This section describes the various methods for inserting Closed Captions into program streams generated by the NetVX Video Networking System.*

3.3.1 Overview of NetVX Closed Caption Inputs

Analog Line 21

Traditionally, closed captions have been carried on line 21 of the NTSC analog signal.

VANC

SMPTE 334M-2000, Vertical Ancillary Data Mapping for Bit-Serial Interface, specifies a way to carry closed captions in the vertical ancillary data of a digital stream. The standard reserves two DID/SDID pairs for closed captions:

- EIA-708-B uses (DID 0x61, SDID 0x01)
- EIA-608 uses (DID 0x61, SDID 0x02)

Serial Port

Additionally, some closed caption generation systems produce data on a serial port (RS-232) for transmission to an encoder. On the NetVX, the 'Closed Caption Source' specifies which, if any of these alternative should be used.

An encoder uses the configuration value to select a source, extracts the closed captions, and inserts them into the picture user data of the MPEG program stream. Closed caption extraction from ancillary data is independent from the module's VANC feature. If a module supports the VANC feature, one can define a VANC service for closed captions; the caption data would then additionally be passed through as a VANC service. This can be useful, depending on the intended MPEG stream destination.

Similarly, SCTE-104 provides cueing insertion over VANC. When directed to use VANC as the cueing source, an encoder automatically processes the appropriate data packets from the stream (DID 0x41, SDID 0x07). Unlike captions, the module must have the VANC feature for this. It is not necessary to configure a VANC service to enable the processing, but one can be defined. The cueing data would then additionally be passed through as a VANC service.

SCTE-104 commands can be synchronized to RP-188 ancillary time code from the stream (DID 0x60, SDID 0x60). The system automatically extracts the ancillary time code in conjunction with the SCTE-104 commands. Unlike captions, the module must have the VANC feature for this. It is not necessary to configure a VANC service to enable the ancillary time code processing, but one can be defined. The time code data would then additionally be passed through as a VANC service. Note that ancillary time codes are extracted automatically when the encoder's splice trigger is {tcp, vanc}.

Related Topic

For HD Encoders: Section 3.4.1, "How to Configure HD Encoder Vertical Ancillary Data (VANC) Services" on page 70

3.3.2 Overview of NetVX Closed Caption Protocol

The Closed Caption Protocol provides a way to transmit EIA-708 closed captions to an encoder. The NTSC standard carries EIA-608 closed captions on VBI line 21. The ATSC defined EIA-708 as an enhanced closed caption specification for digital television, but its data are not carried on VBI lines. Instead, an encoder receives data over VANC in the input signal, or through a serial data interface.

This application note specifies the so-called 'push-mode' serial interface protocol used for communication of closed caption information between caption sources and digital encoders. The protocol includes support for both EIA-608 captions and EIA-708 'Caption Channel Packets'.

This protocol was originally developed in support of testing the DTVCC system with the 'Grand Alliance' prototype hardware; subsequently this same protocol has achieved a substantial degree of usage in fielded systems. This system differs from SMPTE-333 in that there is no feedback from the video encoder to the caption generator; rather the caption generator is driven by the timing of its input video and transmits the captions to the video encoder. Many systems are now migrating towards transmission within the plant of captioning data using VANC data packets in the SMPTE-292 signal in accordance with SMPTE 334M-2000. The VANC interface resembles this serial protocol, in that neither has a feedback mechanism from the encoder to the caption server.

The protocol was defined to operate over a standard RS-232 type serial connection at 19,200 baud, 8 bits, one stop, no parity (8-N-1). The NetVX requires the use of a Lantronix MSS-100 to convert the serial data to UDP packets, but data carried remain the same.

Caption data are multiplexed into the DTV bitstream in approximate synchronization with the video frames which arrive co-incidentally. It is the responsibility of the sender to ensure that the amount of captioning data that is sent to the encoder does not exceed the channel capacity allocated in A/53. The behavior of the encoder in the case of too much captioning data is not specified.

No flow control is used or supported. If there is no data to send, it is most efficient to send no packets to the encoder. In accordance with the A/53 and EIA-708 standards, the encoder will use the cc_valid=0 method to maintain the captioning channel bandwidth in the case of underflow on this input.

Frame Format

The protocol encapsulates its data in a frame. Bytes are transmitted left to right (8 bits per byte).

Table 3-1 NetVX UDP Frame Format

Start Flag	Protocol	Count	Data	Check	End Flag
SOH (0x01)	1 byte	1 byte	0 to 250 bytes	1 byte	EOT (0x04)

Start Flag

Every frame begins with a flag byte, SOH (0x01).

Protocol

Within a frame, the protocol specifies how to interpret the information.

Table 3-2 'Protocol' Byte Values and Their Meaning

Protocol	Meaning
'1' (0x31)	This value indicates the frame carries EIA-608 data for NTSC field 1.
'2' (0x32)	This value indicates the frame carries EIA-608 data for NTSC field 2.
'A' (0x41)	This value indicates the frame carries EIA-708 data for ATVCC.

Count

The count of all bytes in the frame, including the SOH start flag through the EOT end flag.

Data

Closed caption data. This should contain (count - 5) bytes.

Check

A checksum. This value is set so that the (one-byte) sum of all the bytes in a frame (from the SOH through the EOT) equals zero. The caption server computes a checksum for each frame and inserts that value into the frame to ensure this property.

End Flag

Every frame terminates with an end byte, EOT (0x04). Each packet contains exactly one EIA-708 packet, or an even number of characters of NTSC (EIA-608) closed caption data. Both field-1 and field-2 (XDS) 608 caption data are supported by this protocol.

3.3.3 How to Use UDP to Insert Closed Captions Into an MPEG-2 Program

Abstract: *Use this procedure to include UDP-based EIA-708-compliant closed captioning data in the MPEG-2 program multiplex.*

Prerequisites

- A configured MPEG-2 program.
- A serial-based source of closed captions to go along with the program.
- A properly configured and installed 'serial to UDP converter' such as a Lantronix MSS100.
- TCP/IP connectivity between the Lantronix MSS100 and the NetVX Video Networking System.

Note: (1) UDP Port Calculation: The Lantronix MSS100 requires both an IP address and a UDP port. Use the NetVX's IP address. The UDP port number may be calculated using the formula (65200 + NetVX encoder slot number). The NetVX listens for Closed Captioning data on this range of port numbers.
(2) Contact Technical Support if you have difficulty and need an Application Note describing how to configure the Lantronix MSS100.

Procedure

1. Configure the MPEG-2 program on an encoder module. See Section 3.2.2, "How to Encode Material Using MPEG-2" on page 64.
2. Wire the serial end of the Lantronix MSS100 to the Closed Caption source.
3. Wire the Ethernet end of the Lantronix MSS100 to a network that provides TCP/IP connectivity to the NetVX.
4. In Vidiem™, click 'Device > Read' to read in the system configuration.
5. Expand the 'Modules' branch of the configuration tree.
6. Expand the 'Encoders' branch.
7. Double-click the desired encoder. Vidiem™ opens the 'Encoder Properties' dialog to the 'Program' screen.
8. In the 'Closed Caption Source' drop down, select 'UDP' *.
9. Select 'Device > Write…' to write these changes to the system.

Note: * To stop closed captions from entering the multiplex, set the 'Closed Caption Source' control to 'None'.

Related Topic

"How to Insert Closed Captions Into an MPEG-2 Program Using VBI" on page 69

3.3.4 How to Insert Closed Captions Into an MPEG-2 Program Using VBI

Abstract: *Use this procedure to include VBI-based EIA-608-compliant closed captioning data in the MPEG-2 program multiplex.*

Prerequisites

- A configured MPEG-2 program.
- A video source that includes closed captions on line 21.

Procedure

1. Configure the MPEG-2 program on an encoder module. See Section 3.2.2, "How to Encode Material Using MPEG-2" on page 64.
2. In Vidiem™, click 'Device > Read' to read in the system configuration.
3. Expand the 'Modules' branch of the configuration tree.
4. Expand the 'Encoders' branch.
5. Double-click the desired encoder. Vidiem™ opens the 'Encoder Properties' dialog to the 'Program' screen.
6. In the 'Closed Caption Source' drop down, select 'VBI' *.
7. Click on 'VBI Lines' in the 'Encoder Properties' dialog's sub-navigation tree.
8. Under 'Entries' click on 'Field 1, Line 21'.
9. In the 'Function' drop down choose 'Closed Caption'.
10. Click the 'OK' button.
11. Select 'Device > Write…' to write these changes to the system.

Note: * To stop closed captions from entering the multiplex, set the 'Closed Caption Source' control to 'None'.

Related Topic

"How to Use UDP to Insert Closed Captions Into an MPEG-2 Program" on page 68

3.4 ENC: VANC, Embedded Data and Splice Point-Related Procedures

3.4.1 How to Configure HD Encoder Vertical Ancillary Data (VANC) Services

Abstract: *This section describes how to configure the NetVX's HD encoder to insert VANC data into the MPEG-2 transport stream.*

⚠ CAUTION!

Caution: If your source material includes VANC Closed Captions, and you intend to use the following procedure to transport additional VANC data services, then you must be sure to explicitly add a Closed Captions Service (as described below).

1. Identify each of the various types of VANC services present within your source material.
2. Calculate the data rate for each of these services. Determine the sum of these rates.
3. Expand the 'Modules' branch of the configuration tree.
4. Expand the 'Encoders' branch.
5. Double-click the desired encoder. Vidiem™ opens the 'Encoder Properties' dialog.
6. Click on the 'VANC Data' branch in the dialog's sub-navigation tree.
7. Set the 'Total VANC Data Rate' to the value determined in Step 2.
8. Choose whether or not you want to enable the DID Filter (Section 9.3.15, "Config > Encoder > VANC Data > VANC Services Dialog" on page 285).
    - If you choose not to enable the DID filter, then see the column describing services that will 'Pass Through with Filter OFF' in Table 9-9, "DID/SDID Value Ranges and Passthrough Behavior When Filter is Off" on page 285. Then proceed to Step 13.
    - If you choose to enable the DID filter, then continue with the following steps.
9. Check the 'Enable DID Filter' checkbox.
10. Highlight 'Service 1' in the 'Entries' list.
11. Select either the 'Unrestricted Data Service' or the 'Restricted Data Service' radio button.
    - Use 'Unrestricted Data Service' if you want to manually specify the Data ID (DID) and the Secondary Data ID (SDID) for the selected 'Service'. Both of these fields require HEX values as specified in SMPTE 291M-1998, 'Ancillary Data Packet and Space Formatting'. See Table 9-9, "DID/SDID Value Ranges and Passthrough Behavior When Filter is Off" on page 285 for details on valid values.
    - Use 'Well Known DID/SDID Pair' if you are confident about the kind of VANC data that is provided in your source, but you are unsure about which DID and SDID values to use. When you select a drop down option, Vidiem™ populates the DID and SID values for the selected 'Service' accordingly.
12. For each additional VANC service, go to Step 10 (but select a different service number) and repeat the steps that follow.
13. Select 'Device > Write…' to write these changes to the system.

Note: Please re-read the 'Warning' about Closed Captions at the top of this procedure.

Related Procedure

See Section 3.4.2, "How to Filter Data Channels From a Program Stream" on page 71.

3.4.2 How to Filter Data Channels From a Program Stream

Abstract: *Use this procedure to reduce the number of ancillary data streams carried in a program stream.*

1 Configure the system to demultiplex the MPTS as described in: "How to Demultiplex an ASI or 310M MPTS" on page 92.
- Under 'TS Demultiplexers' expand the configuration tree and double-click on the VC carrying the desired program.
- Double-click 'VC Control' in the sub-navigation tree of the 'TS Demultiplexer Properties' dialog.
- Click on 'Program, Data Filter' in the 'TS Demultiplexer Properties' sub-navigation tree.
- Place a check mark next to each Data service that you want to keep in the stream.

Note: Data services are listed in their respective PMT order.

2 Select 'Device > Write…' to write these changes to the system.

Related Procedures

See Section 3.4.1, "How to Configure HD Encoder Vertical Ancillary Data (VANC) Services" on page 70
See Section 3.5.6, "How to Filter Audio Channels From a Program Stream" on page 81\

3.4.3 How to Configure an Encoder to Receive GPI-Triggered Splice Points

Abstract: *The NetVX supports bit stream splicing compliant with SCTE35-2004. This topic explains how to configure the NetVX General Purpose Inputs (GPIs) to trigger splice point insertions into the MPEG-2 bit stream.*

1 Configure the desired system GPI(s) to support splicing.
- **1a** Expand the 'System' branch in the navigation tree.
- **1b** Double-click the 'GPI Contacts' branch to open the 'GPI Contacts' dialog.
- **1c** In the 'Entries' list, highlight the desired GPI.
- **1d** Click the 'Splice' radiobutton.
- **1e** Repeat the previous two steps for any other GPIs that you desire to operate as splice triggers.
- **1f** Click OK,

2 Configure the encoder to support splicing.
- **2a** Expand the 'Encoders' branch in the navigation tree.
- **2b** Double-click the branch corresponding to the encoder generating the stream to receive splice points.
- **2c** In the 'Program Dialog's' sub-navigation tree, expand the 'Program' branch.
- **2d** Click on the 'Splicing' branch to open the 'Splicing' dialog.
- **2e** In the Splicing dialog, specify the amount of pre-roll. (Pre-roll specifies the delay between a splice point trigger and its insertion).
- **2f** In the 'Trigger' drop-down list, select the GPI that shall trigger the insertion of splice points for this encoder.

3 Select 'Device > Write…' to write these changes to the system.

Related Topics

- See Section 3.4.4, "How To Configure an Encoder to Receive IP-Triggered Splice Points" on page 72.
- See Section 7.4.3, "Config > System > GPI Contacts Dialog" on page 218.
- See Section 9.3.4, "Config > Encoder > Program > Services Dialog" on page 262.

3.4.4 How To Configure an Encoder to Receive IP-Triggered Splice Points

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1 Configure the desired system GPI(s) to support splicing.
   - **1a** Expand the 'System' branch in the navigation tree.
   - **1b** Double-click the 'GPI Contacts' branch to open the 'GPI Contacts' dialog.
   - **1c** In the 'Entries' list, highlight the desired GPI.
   - **1d** Click the 'Splice' radiobutton.
   - **1e** Repeat the previous two steps for any other GPIs that you desire to operate as splice triggers.
   - **1f** Click OK,

2 Configure the encoder to support splicing.
   - **2a** Expand the 'Encoders' branch in the navigation tree.
   - **2b** Double-click the branch corresponding to the encoder generating the stream to receive splice points.
   - **2c** In the 'Program Dialog's' sub-navigation tree, expand the 'Program' branch.
   - **2d** Click on the 'Splicing' branch to open the 'Splicing' dialog.
   - **2e** In the Splicing dialog, specify the amount of pre-roll. (Pre-roll specifies the delay between a splice point trigger and its insertion).
   - **2f** In the 'Trigger' drop-down list, select the GPI that shall trigger the insertion of splice points for this encoder.

3 Select 'Device > Write…' to write these changes to the system.

Related Topics

- See Section 3.4.3, "How to Configure an Encoder to Receive GPI-Triggered Splice Points" on page 71.
- See Section 7.4.3, "Config > System > GPI Contacts Dialog" on page 218.
- See Section 9.3.4, "Config > Encoder > Program > Services Dialog" on page 262.

3.5 AUD: Associated and Standalone Audio Configuration Procedures

3.5.1 Overview of AUD-D14 Associated Audio

The AUD-D14 module can provide up to four additional channels of audio encoding or decoding capacity. The AUD-D14 adheres to the following principles of operation.

General Principles of Associated Audio

- An encoder/decoder can have associated audio channels from up to four separate auxiliary audio modules. The previous limit of four total associated channels still exists, but those four channels can reside on one to four separate modules.
- Auxiliary audio channels from a single module can be associated with different encoders or decoders. For example, auxiliary channel 1 could be associated with an encoder in slot 6, and auxiliary channel 2 could be associated with an encoder in slot 7.
- SMPTE-302 encoding imposes some restrictions. First, a module supports no more than two SMPTE-302 channels. Second, when encoding two SMPTE-302 channels, they must be paired: channels {1, 2} or channels {3, 4}. Any single channel can be configured as SMPTE-302. Third, if two channels are encoding SMPTE-302 and they are mode {associated}, they must be associated with the same encoder. When SMPTE-302 encoding is being used, the non-SMPTE-302 channels may be configured, but they must comply with all other constraints.
- Auxiliary audio channels on a module cannot mix Dolby AC-3 and MPEG audio compression/decompression (SMPTE-302 is compatible with either compression scheme). This constraint applies across all combinations of all functions and all association modes. For example, if one channel is encoding MPEG audio, the module cannot use AC-3 audio on any other channel (either encoding or decoding).
- When a Harris APM6800+ module is used to contribute an externally-compressed audio stream to a ENC-A21, both pieces of equipment must be genlocked.

Applications

The following diagrams illustrate the AUD-D14's encoding and decoding modes of operation.

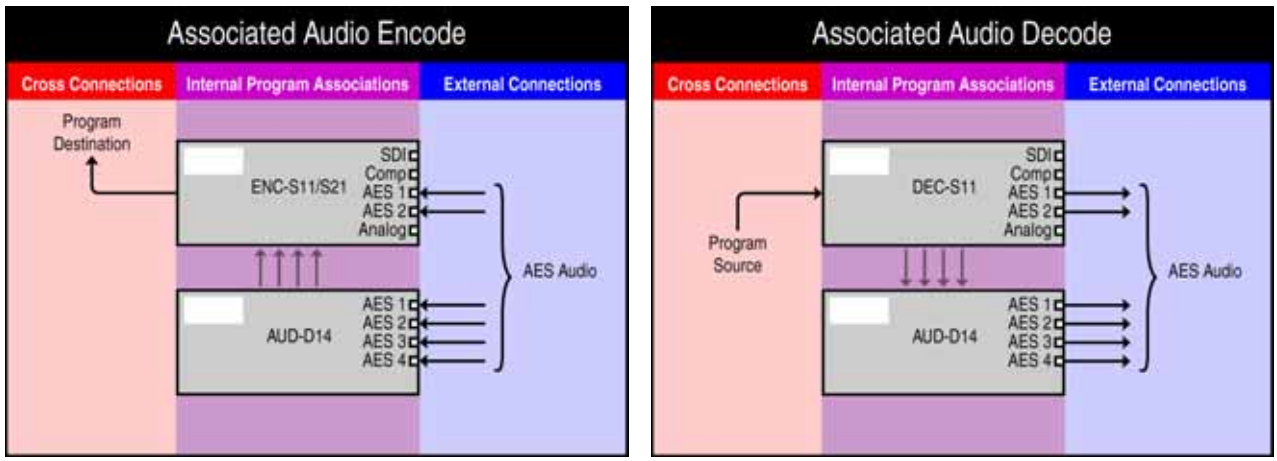


Figure 3-1 AUD-D14 Audio Encode and Decode Modes of Operation

Applications

This diagram illustrates the AUD-D14's channels operating in mixed (encoding and decoding) modes of operation.

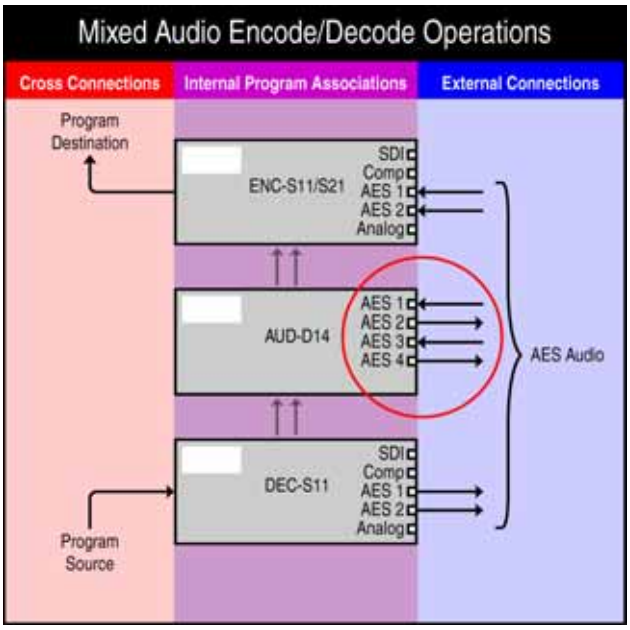


Figure 3-2 AUD-D14 Performing Mixed Modes of Operation

Note: Each AUD-D14 channel operates either as an encoder or a decoder. Any combination of encoders and decoders is possible across the four channels provided by each module.

Related Procedures

- See Section 3.2.2, "How to Encode Material Using MPEG-2" on page 64.
- See Section 3.2.3, "How to Decode MPEG-2 Material" on page 65
- See Section 3.5.2, "How to Configure a Standalone Audio Encoding Channel" on page 75
- See Section 3.5.3, "How to Configure a Standalone Audio Decoding Channel" on page 76
- See Section 3.5.4, "How to Associate Audio Channels with an Encoding Program" on page 77
- See Section 3.5.5, "How to Decode Associated Audio Channels" on page 79
- See Section 3.5.6, "How to Filter Audio Channels From a Program Stream" on page 81

3.5.2 How to Configure a Standalone Audio Encoding Channel

Abstract: *Use this procedure to configure an AUD-D14 channel as a standalone audio encoder.*

Procedure

1. Expand the 'Modules' branch of the configuration tree.
2. Expand the 'Encoders' branch.
3. Double-click the desired AUD-D14 encoding channel. Vidiem™ opens the 'Encoder Properties' dialog.
4. Set the various encoder properties as desired and press the 'OK' button to dismiss the 'Encoder Properties' dialog.

Note: Use the 'Channel Number' field to specify the number of this audio channel in the PMT.

5. In the configuration tree, drag the audio channel and to drop it on any of the following receivers.
   - An ATM VC for network transmission.
   - A GBE VC for network transmission.
   - A MUX VC.
   - An audio-only decoder.
   - An MPEG decoder.
6. Select 'Device > Write…' to write these changes to the system.

Related Procedures

- See Section 3.2.2, "How to Encode Material Using MPEG-2" on page 64.
- See Section 3.2.3, "How to Decode MPEG-2 Material" on page 65
- See Section 3.5.1, "Overview of AUD-D14 Associated Audio" on page 73
- See Section 3.5.3, "How to Configure a Standalone Audio Decoding Channel" on page 76
- See Section 3.5.4, "How to Associate Audio Channels with an Encoding Program" on page 77
- See Section 3.5.5, "How to Decode Associated Audio Channels" on page 79
- See Section 3.5.6, "How to Filter Audio Channels From a Program Stream" on page 81

3.5.3 How to Configure a Standalone Audio Decoding Channel

Abstract: *Use this procedure to configure an AUD-D14 channel as a standalone audio decoder.*

Procedure

1. Expand the 'Modules' branch of the configuration tree.
2. Expand the 'Decoders' branch.
3. Double-click the desired AUD-D14 decoding channel. Vidiem™ opens the 'Decoder Properties' dialog.
4. Set the various decoder properties as desired and press the 'OK' button to dismiss the 'Decoder Properties' dialog.
5. In the configuration tree, drag the source audio channel from any of the following possible sources and drop it on the audio decoder configured in the previous steps.
    - An ATM VC for network transmission.
    - A GBE VC for network transmission.
    - A MUX VC.
    - An audio-only decoder.
    - An MPEG decoder.
6. Select 'Device > Write…' to write these changes to the system.

Related Procedures

- See Section 3.2.2, "How to Encode Material Using MPEG-2" on page 64.
- See Section 3.2.3, "How to Decode MPEG-2 Material" on page 65
- See Section 3.5.1, "Overview of AUD-D14 Associated Audio" on page 73
- See Section 3.5.2, "How to Configure a Standalone Audio Encoding Channel" on page 75
- See Section 3.5.4, "How to Associate Audio Channels with an Encoding Program" on page 77
- See Section 3.5.5, "How to Decode Associated Audio Channels" on page 79
- See Section 3.5.6, "How to Filter Audio Channels From a Program Stream" on page 81

3.5.4 How to Associate Audio Channels with an Encoding Program

Abstract: *Use this procedure to associate one or more AUD-D14 audio channels with a program generated by an MPEG-2 encoder.*

Prerequisites

At least one MPEG-2 encoding program must exist in the system, or system configuration, in which you are working. See Section 3.2.2, "How to Encode Material Using MPEG-2" on page 64.

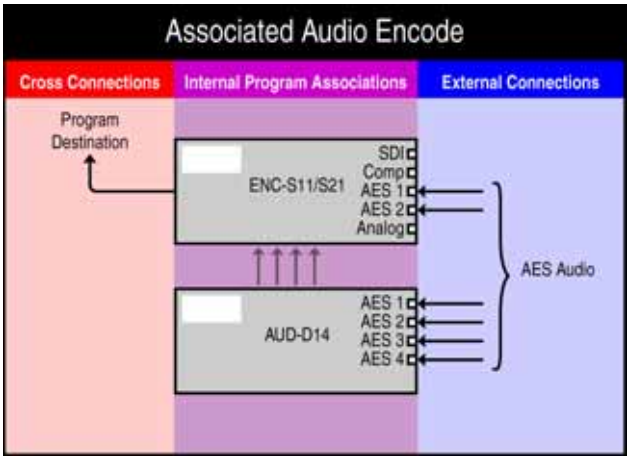


Figure 3-3 Four Channels of Audio Associated with One Encoder

Procedure

1. Expand the 'Modules' branch of the configuration tree.
2. Expand the 'Encoders' branch.
3. Double-click the desired AUD-D14 encoding channel. Vidiem™ opens the 'Encoder Properties' dialog.
4. Set the various encoder properties as desired and press the 'OK' button to dismiss the 'Encoder Properties' dialog.
5. In the configuration tree, drag the audio channel and to drop it on an encoder to create an association.
6. Select 'Device > Write…' to write these changes to the system.
7. Repeat the above steps to associate up to four audio channels per encoder.

Notes

- Once an audio channel is associated with an encoder, it is disabled as a decoder in the decoders branch.
- Single-click on an associated audio encoder in the configuration tree, and the tag name of the encoder with which it is associated will turn bold.
- When associated audio is configured to operate in conjunction with an ENC-H11, Vidiem will enforce the use of the 'Use Separate PCR PID' function.
- Auxiliary audio encoding channels (with function set to 'encode') of a single module must be paired. Channels 1 and 2 form one pair; channels 3 and 4 form the other pair. Within each encoding pair, the modes must match: both {associated} or both {standalone}. Moreover, an associated encoding pair must reference the same base encoder by having identical associated slot values.
- The two pairs are independent, and so channels {1, 2} do not constrain channels {3, 4}. The pairing constraints affect encoding channels only. Split channel pairs (encode+decode) and decode channel pairs (decode+decode) are not constrained with regard to the mode or associated slot.
- A module supports no more than one SMPTE-302 channel, defined by the control channel's function set to {encode} and the audio standard set to {smpte302-*}.
- When encoding one SMPTE-302 channel, the other three (non-SMPTE-302) channels may be configured, but they must comply with all other constraints. Any single channel can be configured as for SMPTE-302 encoding.
- Auxiliary audio channels on a module cannot mix Dolby AC-3 and MPEG audio compression/decompression (SMPTE-302 is compatible with either compression scheme). This constraint applies across all combinations of all functions and all association modes. For example, if one channel is encoding MPEG audio, the module cannot use AC-3 audio on any other channel (either encoding or decoding).

Related Procedures

- See Section 3.2.2, "How to Encode Material Using MPEG-2" on page 64.
- See Section 3.2.3, "How to Decode MPEG-2 Material" on page 65
- See Section 3.5.1, "Overview of AUD-D14 Associated Audio" on page 73
- See Section 3.5.2, "How to Configure a Standalone Audio Encoding Channel" on page 75
- See Section 3.5.3, "How to Configure a Standalone Audio Decoding Channel" on page 76
- See Section 3.5.5, "How to Decode Associated Audio Channels" on page 79
- See Section 3.5.6, "How to Filter Audio Channels From a Program Stream" on page 81

3.5.5 How to Decode Associated Audio Channels

Abstract: *This procedure explains how to configure and audio-only decoder to decode additional audio channels associated with an encoder program.*

Prerequisites

At least one MPEG-2 encoding program must exist in the system, or system configuration, in which you are working. See Section 3.2.3, "How to Decode MPEG-2 Material" on page 65.

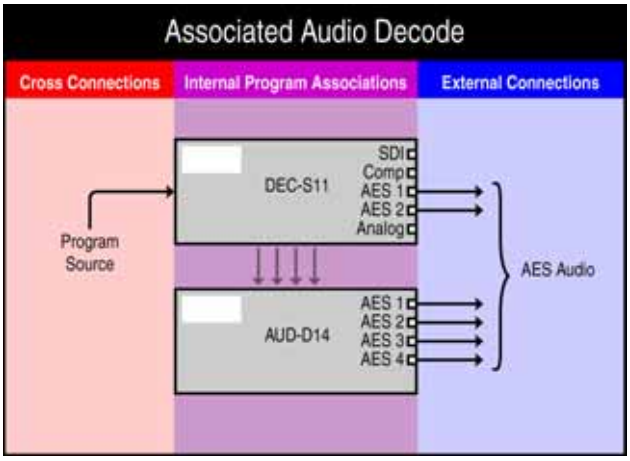


Figure 3-4 Decoding Four Channels of Associated Audio

Procedure

1. Expand the 'Modules' branch of the configuration tree.
2. Expand the 'Decoders' branch.
3. Double-click the desired AUD-D14 decoding channel. Vidiem™ opens the 'Decoder Properties' dialog.
4. Set the various decoder properties as desired. Take special care to set the following properties on the 'Audio Properties' page.
    - Specify the 'Source'.
    - Specify the 'Program Number'.
5. Press the 'OK' button to dismiss the 'Decoder Properties' dialog.
6. In the configuration tree, drag the audio channel and to drop it on an decoder to create an association.
7. Select 'Device > Write…' to write these changes to the system.
8. Repeat the above steps to decode up to four associated audio channels per encoder.

Notes

- Once an audio channel is associated with an decoder, it is disabled as a encoder in the encoders branch.
- Single-click on an associated audio decoder in the configuration tree, and the tag name of the decoder with which it is associated will turn bold.
- An encoder/decoder can have associated audio channels from up to four separate auxiliary audio (AUD-D14) modules. The previous limit of four total associated channels still exists, but those four channels can reside on one to four separate modules.
- A module supports no more than one SMPTE-302 channel, defined by the control channel's function set to {encode} and the audio standard set to {smpte302-*}.
- When encoding one SMPTE-302 channel, the other three (non-SMPTE-302) channels may be configured, but they must comply with all other constraints. Any single channel can be configured as for SMPTE-302 encoding.
- Auxiliary audio channels on a module cannot mix Dolby AC-3 and MPEG audio compression/decompression (SMPTE-302 is compatible with either compression scheme). This constraint applies across all combinations of all functions and all association modes. For example, if one channel is encoding MPEG audio, the module cannot use AC-3 audio on any other channel (either encoding or decoding).

Related Procedures

- See Section 3.2.2, "How to Encode Material Using MPEG-2" on page 64.
- See Section 3.2.3, "How to Decode MPEG-2 Material" on page 65
- See Section 3.5.1, "Overview of AUD-D14 Associated Audio" on page 73
- See Section 3.5.2, "How to Configure a Standalone Audio Encoding Channel" on page 75
- See Section 3.5.3, "How to Configure a Standalone Audio Decoding Channel" on page 76
- See Section 3.5.4, "How to Associate Audio Channels with an Encoding Program" on page 77
- See Section 3.5.6, "How to Filter Audio Channels From a Program Stream" on page 81

3.5.6 How to Filter Audio Channels From a Program Stream

Abstract: *Use this procedure to use a TMX module to reduce the number of audio streams carried in a program stream.*

1. Configure the system to demultiplex the MPTS as described in: "How to Demultiplex an ASI or 310M MPTS" on page 92.
2. Under 'TS Demultiplexers' expand the configuration tree and double-click on the VC carrying the desired program.
3. Double-click 'VC Control' in the sub-navigation tree of the 'TS Demultiplexer Properties' dialog.
4. Click on 'Program, Audio Filter' in the 'TS Demultiplexer Properties' sub-navigation tree.
5. Place a check mark next to each Audio service that you want to keep in the stream.

Note: Audio services are listed in their respective PMT order.

6. Select 'Device > Write…' to write these changes to the system.

Related Procedures

- See Section 3.2.2, "How to Encode Material Using MPEG-2" on page 64.
- See Section 3.2.3, "How to Decode MPEG-2 Material" on page 65
- See Section 3.5.1, "Overview of AUD-D14 Associated Audio" on page 73
- See Section 3.5.2, "How to Configure a Standalone Audio Encoding Channel" on page 75
- See Section 3.5.3, "How to Configure a Standalone Audio Decoding Channel" on page 76
- See Section 3.5.4, "How to Associate Audio Channels with an Encoding Program" on page 77
- See Section 3.5.5, "How to Decode Associated Audio Channels" on page 79

3.6 ATM: Video Over ATM Procedures

3.6.1 How to Send Video Over an ATM Connection

Abstract: *Use this procedure to route a video stream onto an ATM connection.*

1. Configure a video source. Any of the following may be used.
   - An encoder.
   - A de-multiplexed transport stream.
   - An IP stream carrying video.
2. Configure an ATM VC as described in "How to Create an ATM Virtual Channel" on page 136. This VC shall to operate as a cross connection destination.
3. Create a cross connection linking the source VC created in step 1 to the destination VC created in step 2. The procedure for creating cross connections is described in "How to Create a Cross Connection" on page 146.
4. Select 'Device > Write…' to write these changes to the system.

Once these changes are uploaded to the system, the video created at the source is transmitted to the destination.

3.6.2 How to Receive Video from an ATM Connection

Abstract: *Use this procedure to decode video received via an ATM connection.*

1. Configure an ATM VC as described in "How to Create an ATM Virtual Channel" on page 136. This VC shall to operate as the cross connection source.
2. Configure a video receiver. Any of the following may be used.
   - A decoder. The NetVX's decoders do not require any explicit configuration in order to simply decode video. However you may want to customize the decoder's settings.
   - A Mux VC.
3. Create a cross connection linking the source VC created in step 1 to the destination VC created in step 2. The procedure for creating cross connections is described in "How to Create a Cross Connection" on page 146.
4. Select 'Device > Write…' to write these changes to the system.

3.7 GBE/ATM: IP on ATM Procedures

Abstract: *This section explains various approaches for configuring the NetVX to carry IP over ATM.*

3.7.1 How to Configure IP on ATM Networks (Generalized)

Use the following procedure for each NetVX in your network.

1. Study the "How to Configure the NetVX to Support IP on ATM Bridging" on page 85.
2. Create a "IP on ATM Configuration Worksheet" on page 87 for each NetVX in your network. This worksheet consolidates all pertinent configuration information needed to support IPOA. Technical support may request copies of these worksheets if contacted for help.
3. Assign the NetVX an ATM IP Address and subnet mask. These settings are located in the LIS table.
   See the topic "How to Configure the Logical IP Subnet (LIS) Table Entries" on page 166 for detailed instructions.
4. On the System Controller - Create one VC for every other NetVX in the network.
   See the topic "How to Create an IP Virtual Channel" on page 139 for details.
5. On the ATM module - Create one VC to correspond to each System Controller VC created in Step 3.
   See the topic "How to Create a 'Copy' ATM Virtual Channel" on page 138 for details.
6. Create IPOA cross connections linking the System Controller VCs created in Step 3, with the ATM Module VCs created in Step 4. Vidiem™ automatically creates cross-connections in each direction once the first is created.
   See the topic "How to Create an IP Virtual Channel" on page 139 for detailed instructions.

At this point, systems that are connected through IPOA should begin using Inverse ATM ARP to resolve far end IP addresses.

7. Check the Inverse ATM ARP status table on each system. Verify that ARP is successful and that new, far-end IP addresses are added to the table.
   - Go to 'Status > (select the desired system in the status tree) > Modules > IP Modules > SYS-xxx > IP Inverse ATM ARP tab).
   - Read the "IP Module Configuration" on page 403 for details on Inverse ATM ARP.

Note: SYS-xxx represents any system controller module: SYS-G10, SYS-A12, SYS-A22.

   - Ensure that the Inverse ATM ARP table shows an entry for every other NetVX on the network. If this table is blank, then IPOA communication between NetVXs was unsuccessful. If a particular ARP table entry is missing, then check connectivity between systems.
8. On any NetVX used to bridge connections between other NetVX systems, create VCs with function 'ATM' on the bridging ATM modules. See "How to Configure the NetVX to Support IP on ATM Bridging" on page 85. In this example, the VCs supporting cross connections E and F serve this function. Four VCs are used rather than two because ATM VCs are unidirectional. Cross connections link these VCs in both directions.
9. Enable RIP as described in "How to Enable Router Information Protocol (RIP)" on page 167 or manually create an IP routing table entry for each host IP address that you want to reach on any other subnet(s) to which the NetVX is attached.
   For example, to FTP files to a PC located with a NetVX System Controller on a remote Ethernet subnet, then the IP routing table should have en entry for that PC's IP address and the address of the next hop used to reach that address. See the topic "How to Manually Configure the IP Routing Table" on page 150 for detailed instructions.

3.7.2 Blank IPOA Network Worksheet

Abstract: *Print a copy of this topic for each NetVX in your network that shall support IP on ATM. Use this sheet as a guide to gather the information needed to configure your IPOA systems. Your network topology and your systems may vary.*

Table 3-3 Blank IPOA Network Worksheet

Tag = _____; Ethernet IP Address = _____. _____. _____. _____									
Module Type	**Slot**	**Cross Connected VCs**		**Uses Cross Connections**	**VC Function**	**VC Logical IP Subnet (LIS)**	**VC Payload TX Rate**	**VPI**	**VCI**
		VC	**VC**						
SYS-G10									
ATM-x11									
ATM-x11 (if needed)									

3.7.3 How to Configure the NetVX to Support IP on ATM Bridging

Abstract: *Use this network topology when one or more NetVXs provide the intermediate link between other NetVXs and in-band control is required at more than one location.*

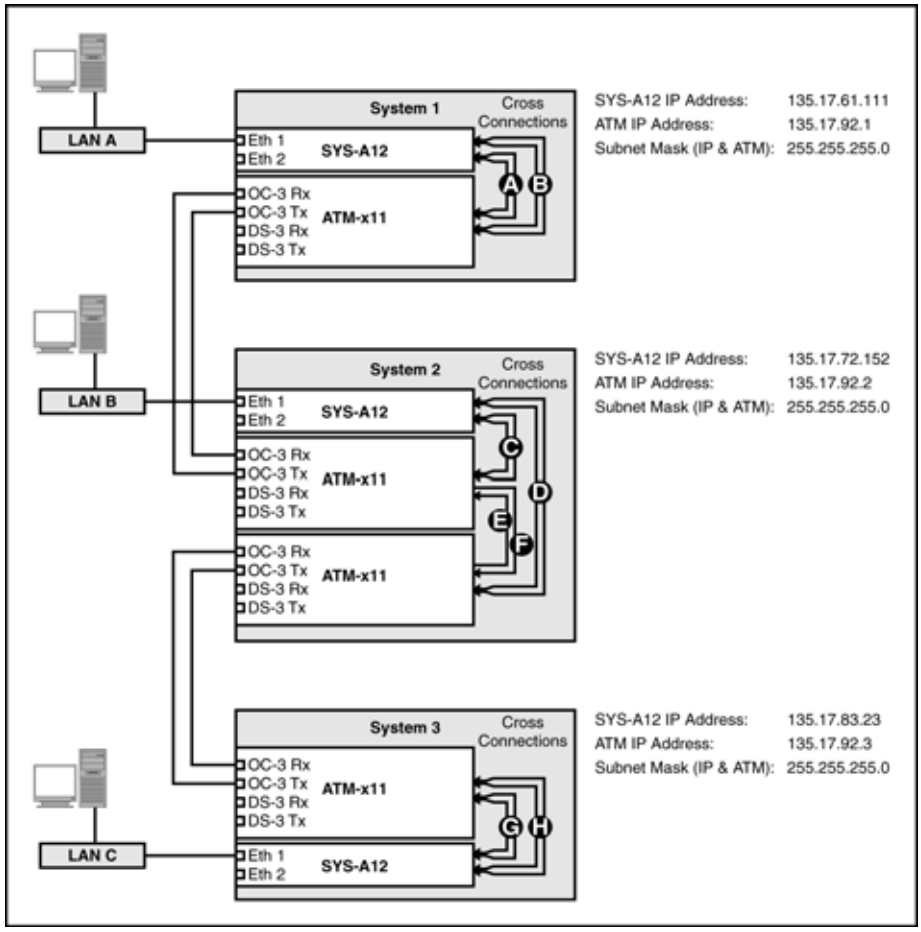


Figure 3-5 IPOA Bridging Topology

1. On each System Controller module, create one VC for every other NetVX in the network. Configure the function on each of these VCs to 'IP on ATM'.
2. On each ATM module, create one VC for every VC created on the System Controller. Configure the function on each of these VCs to 'IP on ATM'.

3 Create bidirectional Cross Connections A, B, C, D, F, an G to link the IPOA VCs created above.

- Cross connection A connects System 1's controller and its ATM module for communication with System 2.
- Cross connection B connects System 1's controller and its ATM module for communication with System 3.
- Cross connection C connects System 2's controller and its ATM module for communication with System 1.
- Cross connection D connects System 2's controller and its second ATM module for communication with System 3.
- Unidirectional cross connections E and F connect System 2's two ATM modules, in each direction, for the purpose of bridging IP traffic between System 1 and System 3. The two VCs supporting these two cross connections are configured with the function 'ATM'. It is important to note that NetVX 2's System Controller *does not perform* the bridging function. This function is carried by cross connections E and F.

Note: The number of bridging cross connections (those with function 'ATM' linking ATM modules) increases in proportion to the number of NetVX's added on each side of the bridge. For example, if in Figure 3-5 another NetVX were added, then NetVX 2 would require another bridging ATM cross connection to allow an 'any to any' connection relationship.

- Cross connection G connects System 3's controller and its ATM module for communication with System 1.
- Cross connection H connects System 3's controller and its ATM module for communication with System 2.

4 Assign each ATM VC to a Logical IP Subnet. This assignment associates the VC with a specific ATM IP Address and Subnet Mask defined, for the specified LIS, in the system's LIS table (System > Logical IP Subnets). When a remote system, connected via IPOA, sends out an inverse ATM ARP request the local system responds with this address. Thereafter the local system is identified by this address. More than one ATM VC on the same ATM module, or in the same system, may be assigned to the same LIS.

5 Enable RIP on each NetVX so that each system can discover and exchange IP data with adjacent subnets. See "How to Enable Router Information Protocol (RIP)" on page 167 for details.

The worksheet below depicts settings corresponding to the diagram in the preceding topic: "How to Configure the NetVX to Support IP on ATM Bridging" on page 85

3.7.4 IP on ATM Configuration Worksheet

Table 3-4 IP on ATM Configuration Worksheet

Tag = NetVX 1; Ethernet IP Address = 135.17.61.111									
Module Type	Slot	Cross Connected VCs		Uses Cross Connections	VC Function	VC Logical IP Subnet (LIS)	VC Payload TX Rate	VPI	VCI
		VC	VC						
SYS-G10	1	1	4	1, 2	IPOA	NA	NA	NA	NA
	1	3	6	3, 4	IPOA	NA	NA	NA	NA
ATM-x11	3	4	1	1, 2	IPOA	LIS 1 (137.17.92.1)	1 Mbps	122	210
	3	6	3	3, 4	IPOA	LIS 1 (137.17.92.1)	1 Mbps	122	211
Tag = NetVX 2; Ethernet IP Address = 135.17.72.152									
Module Type	Slot	Cross Connected VCs		Uses Cross Connections	VC Function	VC Logical IP Subnet (LIS)	VC Payload TX Rate	VPI	VCI
		VC	VC						
SYS-G10	1	5	8	1, 2	IPOA	NA	NA	NA	NA
	1	7	12	3, 4	IPOA	NA	NA	NA	NA
ATM-x11	3	8	5	1, 2	IPOA	LIS 2 (137.17.92.2)	1 Mbps	122	210
	3	10	14	5, 6	ATM	LIS 2 (137.17.92.2)	6 Mbps	122	211
ATM-x11	4	12	7	3, 4	IPOA	LIS 2 (137.17.92.2)	1 Mbps	122	385
	4	14	10	5, 6	ATM	LIS 2 (137.17.92.2)	6 Mbps	122	211
Tag = NetVX System 3; Ethernet IP Address = 135.17.83.23									
Module Type	Slot	Cross Connected VCs		Uses Cross Connections	VC Function	VC Logical IP Subnet (LIS)	VC Payload TX Rate	VPI	VCI
		VC	VC						
SYS-G10	1	9	16	1, 2	IPOA	NA	NA	NA	NA
	1	11	16	3, 4	IPOA	NA	NA	NA	NA
ATM-x11	3	16	9	1, 2	IPOA	LIS 3 (137.17.92.3)	1 Mbps	122	385
	3	18	11	3, 4	IPOA	LIS 3 (137.17.92.3)	1 Mbps	122	211

3.7.5 How to Configure an IPOA Ring Network

Abstract: *Use this network topology to link NetVXs in a ring network configuration.*

This topology has the advantage of providing two possible paths to reach each NetVX. Therefore, in the event of a partial network failure the other path may be discovered and traffic routed appropriately.

The ring topology is dependent upon Router Information Protocol (RIP) for discovery of paths to adjacent subnets. If the path from one subnet to another is broken in one direction, RIP will eventually discover the other path.

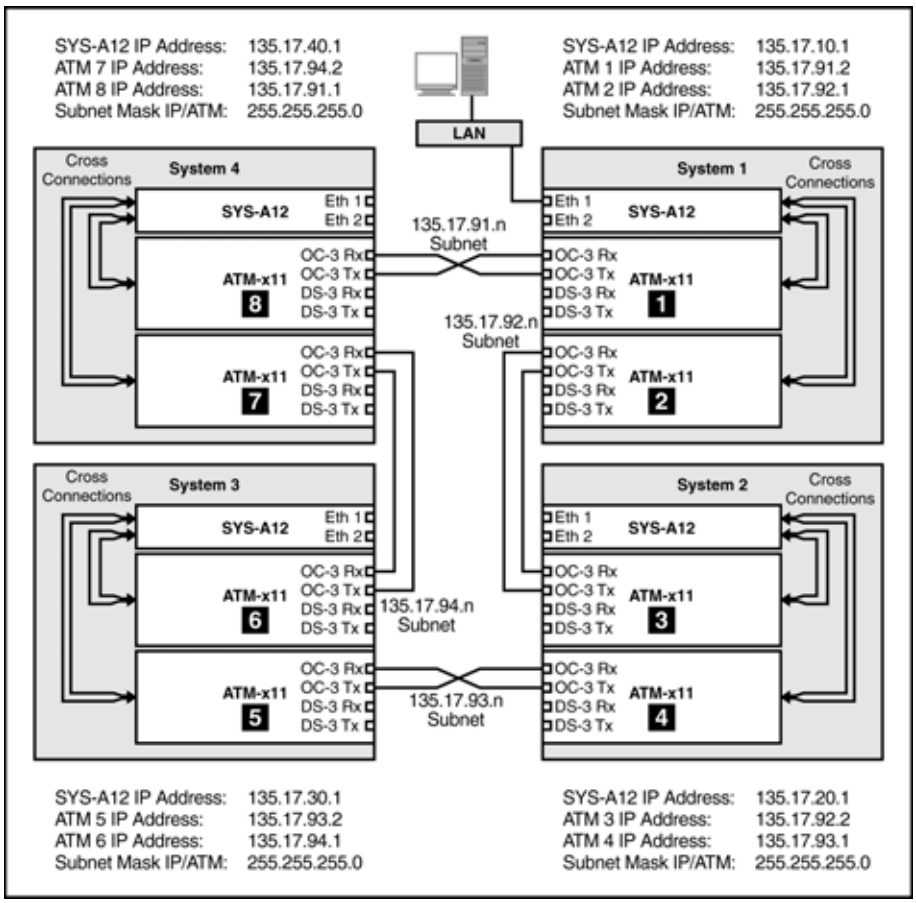


Figure 3-6 IPOA Ring Network Topology

1. Create two VCs on each System Controller module. Configure the function on each of these VCs to 'IP on ATM'.
2. Create one VC on each ATM module. Configure the function on each of these VCs to 'IP on ATM'.
3. Create a Cross Connection for each ATM VC linking it to a System Controller VC.
4. Externally, each ATM module is connected to an ATM module on an adjacent NetVX. This connection may or may not be through an ATM switch.
5. Enable RIP on each system as described in "How to Enable Router Information Protocol (RIP)" on page 167.

3.7.6 IPOA Ring Network Worksheet

The worksheet below depicts settings corresponding to the diagram in the preceding topic: "How to Configure an IPOA Ring Network" on page 88.

Table 3-5 IPOA Ring Network Worksheet

Tag = NetVX 1; Ethernet IP Address = 135.17.10.1									
Module Type	Slot	Cross Connected VCs		Uses Cross Connections	VC Function	VC Logical IP Subnet (LIS)	VC Payload TX Rate	VPI	VCI
		'Source' VC	'Dest' VC						
SYS-G10	1	1	4	1, 2	IPOA	NA	NA	NA	NA
	1	2	6	3, 4	IPOA	NA	NA	NA	NA
ATM-x11	2	4	1	1, 2	IPOA	LIS 1 (137.17.91.2)	1 Mbps	1	91
ATM-x11	3	4	1	3, 4	IPOA	LIS 1 (137.17.92.1)	1 Mbps	1	92
Tag = NetVX 2; Ethernet IP Address = 135.17.20.1									
Module Type	Slot	Cross Connected VCs		Uses Cross Connections	VC Function	VC Logical IP Subnet (LIS)	VC Payload TX Rate	VPI	VCI
		'Source' VC	'Dest' VC						
SYS-G10	1	1	4	1, 2	IPOA	NA	NA	NA	NA
	1	2	6	3, 4	IPOA	NA	NA	NA	NA
ATM-x11	2	4	1	1, 2	IPOA	LIS 1 (137.17.92.2)	1 Mbps	1	92
ATM-x11	3	4	1	3, 4	IPOA	LIS 1 (137.17.93.1)	1 Mbps	1	93
Tag = NetVX System 3; Ethernet IP Address = 135.17.30.1									
Module Type	Slot	Cross Connected VCs		Uses Cross Connections	VC Function	VC Logical IP Subnet (LIS)	VC Payload TX Rate	VPI	VCI
		'Source' VC	'Dest' VC						
SYS-G10	1	1	4	1, 2	IPOA	NA	NA	NA	NA
	1	2	6	3, 4	IPOA	NA	NA	NA	NA
ATM-x11	2	4	1	1, 2	IPOA	LIS 1 (137.17.93.2)	1 Mbps	1	93
ATM-x11	3	4	1	3, 4	IPOA	LIS 1 (137.17.94.1)	1 Mbps	1	94
Tag = NetVX System 4; Ethernet IP Address = 135.17.40.1									
Module Type	Slot	Cross Connected VCs		Uses Cross Connections	VC Function	VC Logical IP Subnet (LIS)	VC Payload TX Rate	VPI	VCI
		'Source' VC	'Dest' VC						
SYS-G10	1	1	4	1, 2	IPOA	NA	NA	NA	NA
	1	2	6	3, 4	IPOA	NA	NA	NA	NA
ATM-x11	2	4	1	1, 2	IPOA	LIS 1 (137.17.94.2)	1 Mbps	1	94
ATM-x11	3	4	1	3, 4	IPOA	LIS 1 (137.17.91.1)	1 Mbps	1	91

3.7.7 Overview of NetVX Inverse ATM ARP Functionality

On the NetVX, System Controller VCs that are configured with the function 'IP on ATM' (IPOA) provide point-to-point links over ATM. To provide correct IP semantics, a NetVX needs to know the IP address of the host at the far end of each System Controller VC. The far-end IP address may be configured in two ways.

Inverse ATM ARP Configuration of Far-End IP Address Configuration

The NetVX uses cross connections linking System controller VCs to ATM VCs in each direction to establish IP on ATM (IPOA) connectivity. After the IPOA configuration is established on an IP module, the module scans its VC table and its Cross-Connection table to identify channels connected to ATM VCs.

The NetVX can use Inverse ATM Address Resolution Protocol (also known as 'Inverse ARP' as described in RFC 2225) to discover this information. The table in the 'IP Inverse ATM ARP' tab presents these results. The IP Inverse ATM ARP table may be dynamically updated, in which case, each Inverse ATM ARP table entry (column) corresponds directly to a System Controller VC. Although some VCs may not be configured for IPOA, inverse ATM ARP table entries have a one-to-one correspondence with virtual channel table entries.

If the far end IP address has not been provisioned, then the module sends inverse ATM ARP requests on these channels. The ATM module, in turn, directs inverse ARP reply messages back to the IP module. The IP module processes these replies, extracts the IP addresses, and updates the inverse ATM ARP table. As specified in RFC 2225, the system refreshes its entries to keep the inverse ATM ARP table current. Old entries drop out of the table if the associated host stops replying to the ARP requests.

Manual Configuration of Far-End IP Address Configuration

The NetVX's craft port interface provides a means to manually specify the far-end IP address for each VC.

⚠ WARNING!

Warning: (1) This approach disables the inverse ATM ARP functionality on each VC on which it is performed.
(2) This approach is strongly discouraged unless you know that your ATM equipment, or your network do not fully (or adequately) support Inverse ATM ARP.

Use the following command at the NetVX's craft port interface to set the IPOA VCs far-end IP address. Substitute `###.###.###.###` with the desired IP address.

```
cfg slot.s/ip/vc.m ipaddr=<###.###.###.###>
```

3.8 TMX: ASI and 310M Mux Demux Procedures

3.8.1 How to Route an ASI or 310M Input to a Demux VC (Pass Through)

Abstract: *Use this procedure to route an entire multi-program ASI or 310M transport stream from a TMX-M12 module's ASI or 310M input interface to a Demux VC. The resulting Demux VC makes the entire multi-program transport stream available to other modules as a cross connection souce.*

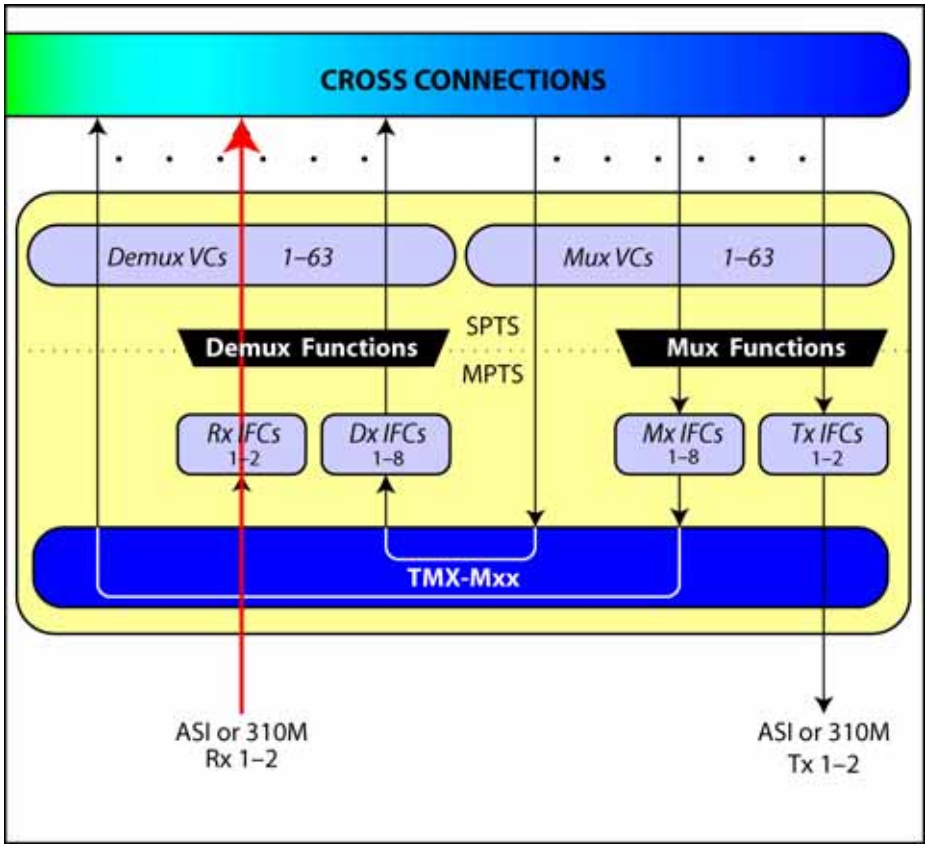


Figure 3-7 Receiving an External MPTS to Passthrough

1 Configure the TMX Receive Interface
   - In Vidiem™'s configuration tree, select 'Modules > TS Receivers' and expand this branch.
   - Right-click on the desired interface and select 'Properties' to open the 'Interface' dialog.
   - Set the 'Mode' to 'Rx-Only'.
   - Check the 'Enable Pass Through' control in the 'Interface' dialog.
   - Click on the 'VC Control' branch.

2 Create and Configure a Single Demux VC
   - Press the 'New' button to create a new Demux VC.
   - (Optional) Enter a tag to identify this VC. You may want to use this tag to identify the source of the multi-program transport stream that is now available on this VC.
   - Specify the 'TS Rate' for this virtual channel. This is the maximum rate allowed through this connection. Data are dropped if this rate is exceeded.

3 Select 'Device > Write…' to write these changes to the system.

At this point, you can use this Demux VC as a cross connection source.

3.8.2 How to Demultiplex an ASI or 310M MPTS

Abstract: *Use this procedure to demultiplex a multi-program ASI or 310M transport stream entering the system from external equipment. The resulting Single Program Transport Streams (SPTSs) are sent to demux VCs. Each Demux VC can serve as a cross connection source providing a single-program transport stream.*

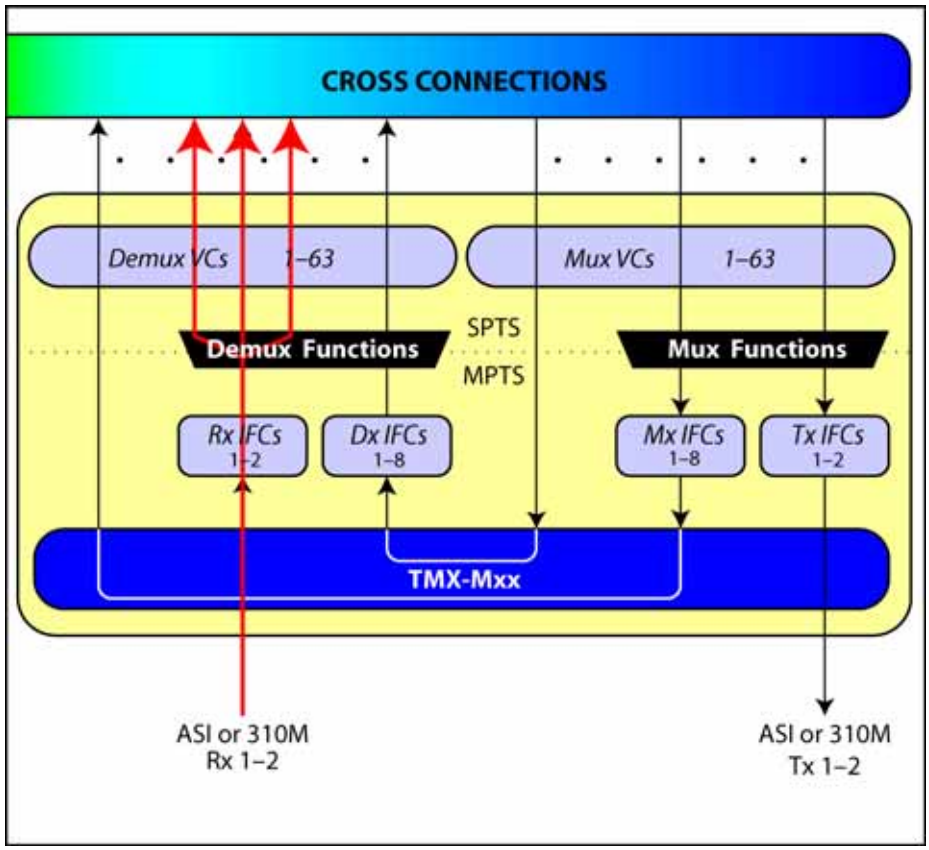


Figure 3-8 Receiving an External MPTS to Demux

1. Configure the TMX Receive Interface
   - In the configuration tree, select 'Modules > TS Receivers' and expand this branch.
   - Right-click on the desired interface and select 'Properties' to open the 'Interface' dialog.
   - Set the 'Mode' to 'Rx-Only'.
   - Verify that the 'Enable Pass Through' control in the 'Interface' dialog is *un*checked; un-check it if it is not.
2. Create and Configure Demux VCs
   - Click on the 'VC Control' branch.
   - Press the 'New' button to create a new Demux VC.
   - (Optional) Enter a tag to identify this VC. You may want to use this tag to identify the source of the single-program transport stream that is now available on this VC.
   - Enter the 'Program Number' of the program in the incoming multi-program transport stream that you want to direct to this Demux VC.
   - Specify the 'TSRate' for this virtual channel. This is the maximum rate allowed through this connection. Data are dropped if this rate is exceeded.
3. Repeat step 2 for any other single program transport streams as desired. Each TMX-M12 module can handle up to 63 Demux VCs.
4. Select 'Device > Write…' to write these changes to the system.

At this point each demux VC carries a single-program transport stream and can operate as a cross connection source.

3.8.3 How to Demultiplex an Internal MPTS

Abstract: *Use this procedure to demultiplex a Multi-Program Transport Stream (MPTS) coming from an **internal** source and create several Demux VCs each containing a single-program transport stream (SPTS).*

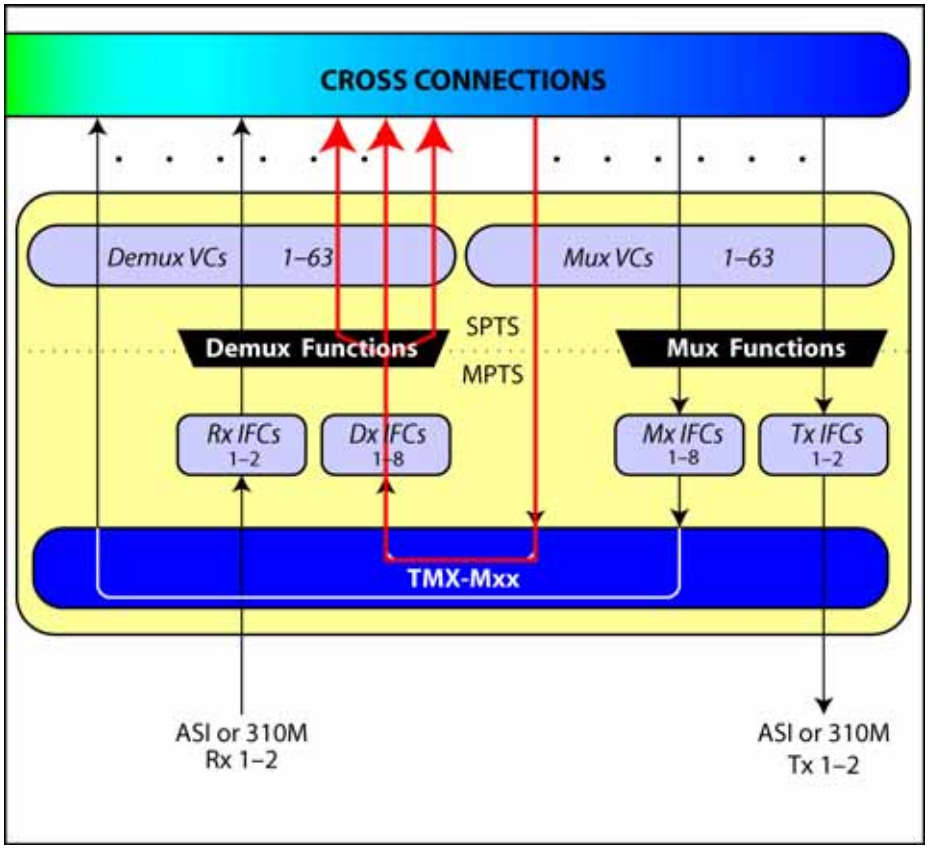


Figure 3-9 Demuxing an Internal MPTS

1 Route the MPTS to a Demux Interface
   - In the configuration tree, drag and drop a MPTS source to a demux interface.

2 Create and Configure Demux VCs
   - Click on the 'VC Control' branch.
   - Press the 'New' button to create a new Demux VC.
   - (Optional) Enter a tag to identify this VC. You may want to use this tag to identify the source of the single-program transport stream that is now available on this VC.
   - Enter the 'Program Number' of the program in the incoming multi-program transport stream that you want to direct to this Demux VC.
   - Specify the 'TS Rate' for this virtual channel. This is the maximum rate allowed through this connection. Data are dropped if this rate is exceeded.

Note: Repeat step 2 for other single program transport streams as desired. Each TMX-M12 module can handle up to 63 Demux VCs.

3 Select 'Device > Write…' to write these changes to the system.

At this point each Demux VC carries a single-program transport stream and each can operate as a cross connection source.

3.8.4 How to Loopback ASI or 310M Input

Abstract: *Use this procedure to route a multi-program ASI or 310M transport stream from the TMX-M12 module's input interface to the same module's corresponding output interface.*

For example, the interface '3.2 TMX-M12' under 'TS Transmitters' corresponds to interface '3.2 TMX-M12' under 'TS Receivers'. Loopback only works between input and output interfaces with matching slot and interface numbers.

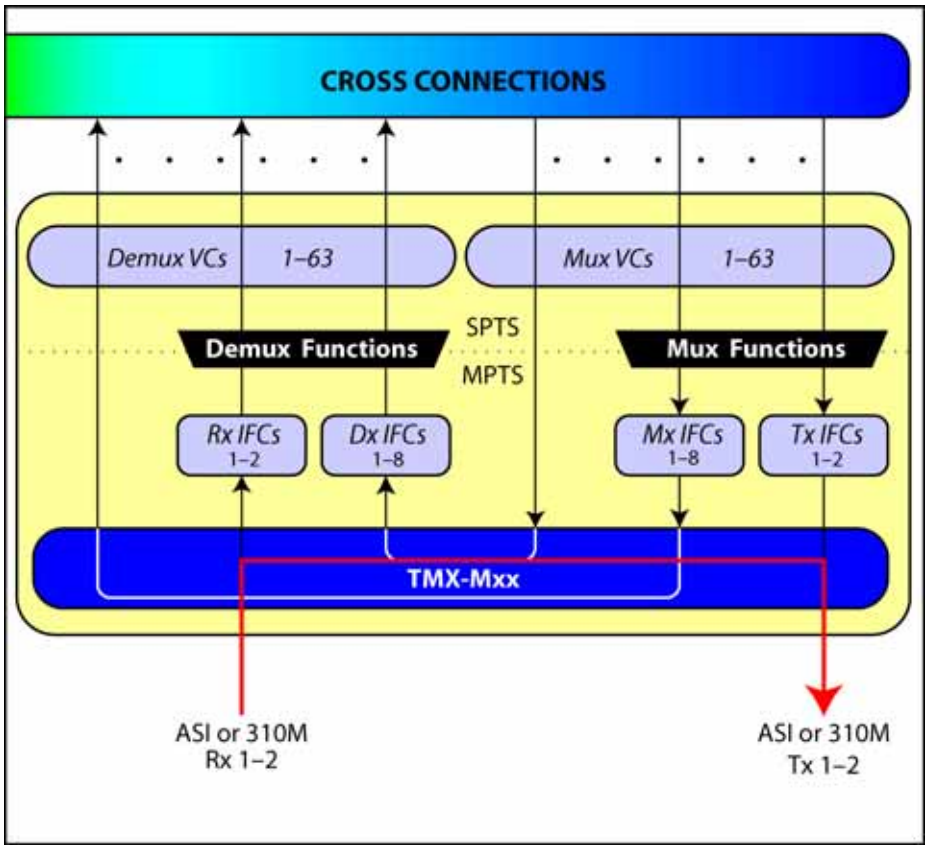


Figure 3-10 MPTS Loopback

1. Connect ASI or 310M signal source to one of the TMX-M12's inputs.
2. In the configuration tree, select 'Modules > TS Transmitters' and expand this branch.
3. Right-click on the *desired* interface and select 'Properties' to open the 'Interface' dialog.
   * The 'desired' transmit interface is the one that corresponds (by both slot and interface number) to the receive interface used in step 1 above.
   - In the 'Interface' dialog, set the 'Mode' to 'Tx-Only'.
   - Check the 'Enable Loopback' checkbox.
4. Select 'Device > Write…' to write these changes to the system.

The signal is now looped in through the Rx interface and back out through the corresponding Tx interface.

3.8.5 How to Route an Internal Transport Stream to an ASI or 310M Output (Pass Through)

Abstract: *Use this procedure to route a transport stream to either an ASI or a 310M output interface.*

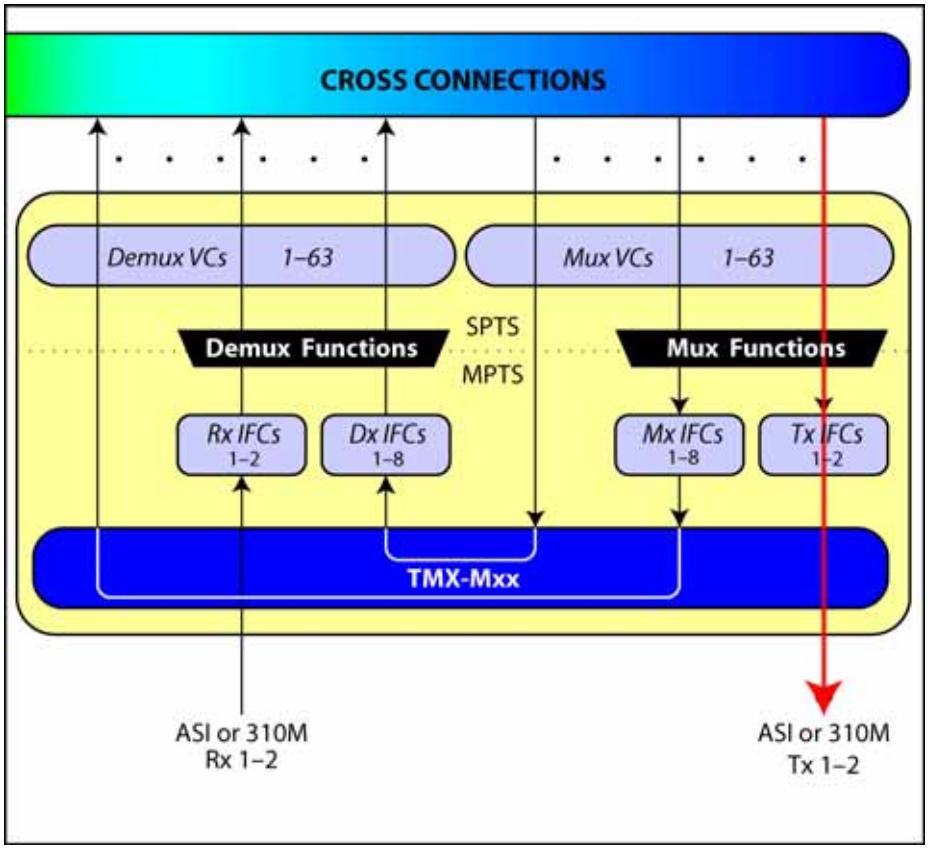


Figure 3-11 Passthrough an Internal MPTS to Transmit

1 Configure the TMX Transmit Interface

- In the configuration tree, select 'Modules > TS Transmitters' and expand this branch.
- Right-click on the desired physical interface (either 'Out 1' or 'Out 2') and select 'Properties' to open the 'TS Transmitter Properties' dialog.
- Click on the 'VC Control' branch and ensure that no more than one VC is configured for this interface. If a single VC is configured for this interface, then skip to step 6 below.
- In the 'VC Control' window, press the 'New' button to create a Mux VC. This Mux VC serves as the cross connection destination.
- (Optional) Enter a tag to identify this VC. You may want to use this tag to identify the source of the multi-program transport stream that is now available on this VC.

Note: The 'Program Number' field may be ignored; it is not used in this configuration.

2 Click on the ‘Interface <interface tag name>’ branch and set the following parameters as desired.
- Tag (for the output channel)
- SI-PSI Mode
- Transport Stream ID
- Set the ‘Mode’ to ‘TX-Only’. Refer to the "Config > TS Transmitter > Interface Dialog" on page 322 for descriptions of this control.
- Check the ‘Enable Pass Through’ control.
- Ensure that the ‘Enable Loopback’ control is unchecked.
- Set the ‘Standard’ as desired.
- Set the ‘Rate’ as desired.

3 Click the ‘OK’ button.

4 Select ‘Device > Write…’ to write these changes to the system.

When the Mux VC is used as a cross connection destination, signals routed over the cross connection are presented on the Tx interface selected in step 2.

3.8.6 How to Multiplex VCs into an MPTS for Tx Output

Abstract: *Use this procedure to multiplex several VCs into a multi-program transport stream (MPTS) and route the output to an ASI or 310M Tx output port. The resulting Mux VCs operate as destinations for cross connections carrying single-program transport streams.*

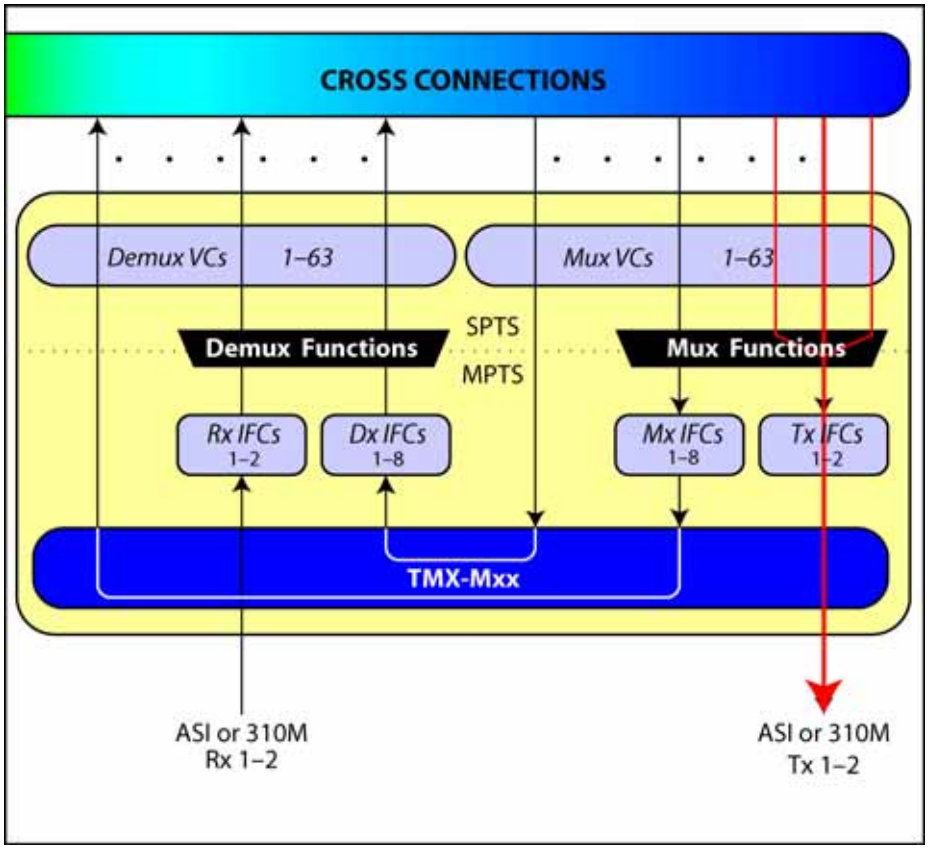


Figure 3-12 Multiplexing Several SPTS to Transmit

1 Configure the TMX Transmit Interface.
- In the configuration tree, select 'Modules > TS Transmitters' and expand this branch.
- Right-click on the desired Tx interface and select 'Properties' to open the 'Transmitter Properties' dialog.

2 In the 'Transmitter Properties' dialog, set the following as desired.
- SI-PSI Mode
- Transport Stream ID
- Set the 'Mode' to 'TX-Only'.

Note: Refer to the "Config > TS Transmitter > Interface Dialog" on page 322 for descriptions of these controls.

3 Ensure that both the 'Enable Pass Through' and the 'Enable Loopback' controls in the 'Interface' dialog are unchecked.
- Set the 'Standard' as desired.
- Set the 'Rate' as desired.

4 Create and Configure Mux VCs

- Click on the ‘VC Control’ branch.
- Press the ‘New’ button to create a new Mux VC.
- (Optional) Enter a tag to identify this VC. You may want to use this tag to identify the source of the multi-program transport stream that is now available on this VC.
- Enter the ‘Program Number’. The program number identifies the program on this VC in the multiplexed multi-program transport stream (MPTS). See also "How to Enable Router Information Protocol (RIP)" on page 167.
- Specify the ‘TS Rate’ for this virtual channel. This is the maximum rate allowed through this connection. Data are dropped if this rate is exceeded.

Note: Create additional VCs by repeating steps 4 above. Create a VC for each single-program transport (SPTS) that shall be added to the multiplex.

- Cross-connect a source, such as an encoder, to each Mux VC created above.

5 Click the ‘OK’ button.

6 Select ‘Device > Write…’ to write these changes to the system.

Mux VCs created in this procedure can operate as cross connection destinations. Signals routed over these cross connections are present in the multiplex on the Tx interface selected in step 2.

3.8.7 Telnet PasswordHow to Multiplex VCs into an MPTS for Internal Use

Abstract: *Use this procedure to multiplex several VCs into a multi-program transport stream (MPTS) and route the output to a Demux VC. One use for this application may be to combine the output from several encoders into one multi-program transport stream and send that stream out of the system via a GBE or ATM networking interface.*

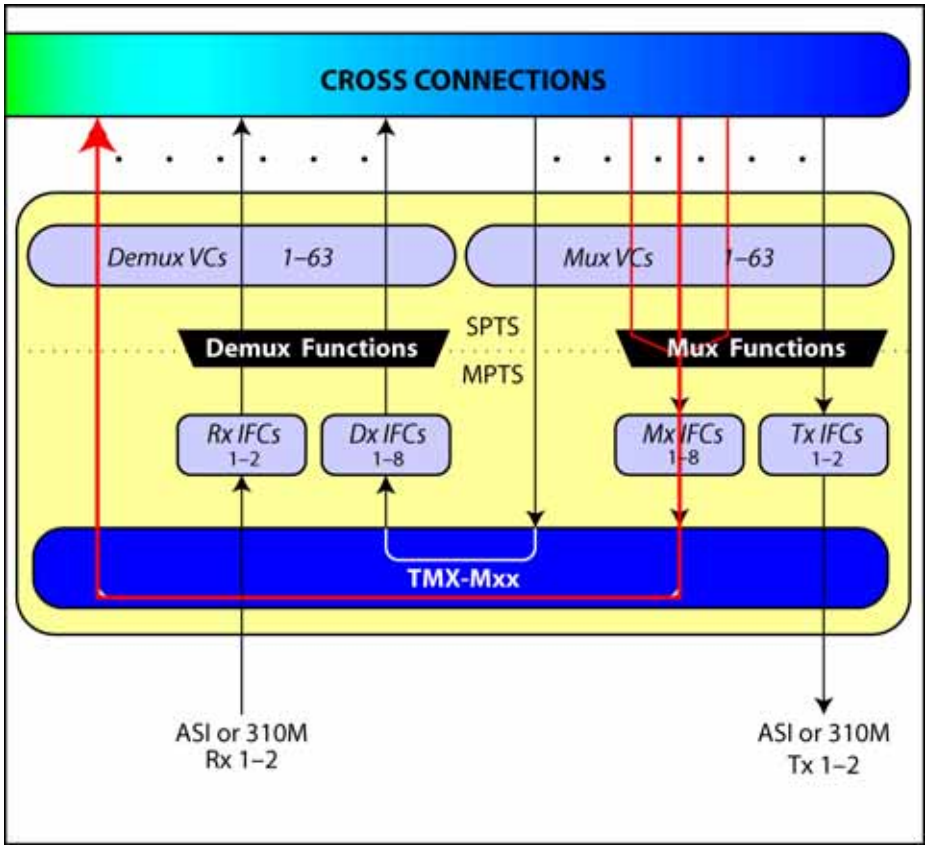


Figure 3-13 Multiplexing Several SPTS to Provide Internally to other Modules

1 Create and Configure Mux VCs
   - **1a** Click on the 'VC Control' branch.
   - **1b** Press the 'New' button to create a new Mux VC.
   - **1c** (Optional) Enter a tag to identify this VC. You may want to use this tag to identify the source of the multi-program transport stream that is now available on this VC.
   - **1d** Enter the 'Program Number' that shall identify the program on this VC in the multiplexed multi-program transport stream (MPTS). See also the "How to Enable Router Information Protocol (RIP)" on page 167.
   - **1e** Specify the 'TS Rate' for this VC. This rate specifies the maximum amount of data allowed through this connection. Data are dropped if this rate is exceeded.
   - **1f** Create additional VCs by repeating Step 1b through Step 1e above. Be sure to create a VC for each single-program transport (SPTS) that shall be added to the multiplex.
   - **1g** Click the 'OK' button.
2 Select 'Device > Write…' to write these changes to the system.
3 Create a Cross Connection to use this Interface.

At this point, the Mux interface carries a multi-program transport stream and can operate as cross connection source linked to an ATM VC or a decoder.

3.9 TMX: Statistical Multiplexing Procedures

3.9.1 Overview of NetVX Statistical Multiplexing

Abstract: *This topic provides an overview of the operational details associated with the NetVX's StatMux feature.*

The NetVX's statistical multiplexing feature is used to reduce the overall amount of bandwidth required to carry a group of locally encoded programs. In Stat Mux mode, programs are analyzed in real time and the NetVX determines, on a moment by moment basis, the optimal amount of bandwidth to apply to each program.

Configuration is straightforward. Cross connections link the various encoder streams to Mux VCs on the TMX module. The TMX module performs the StatMux function.

Note: "How To Configure StatMux for Locally-Encoded Programs" on page 104 details each of the prerequisites and restrictions on encoders and VCs that participate in a Statistical Multiplexing group.

StatMux Group

In the NetVX, a 'StatMux Group' is a set of statistically multiplexed programs all of which are located on the same TMX module transmit (TX) interface.

Bandwidth Calculations for a StatMux Group

The overall bandwidth available for a StatMux Group is composed of the following elements.

- The sum of the 'TS Rates' of all programs in the StatMux group.
- Any remaining un-allocated bandwidth on the interface.

For example, an interface with a 70 Mbps bitrate hosting a StatMux group using 60 Mbps would have 10 Mbps, in the form of null packets, available for use by the StatMux group.

Note: Bandwidth allocated to fixed-rate programs is always excluded from use by the StatMux group.

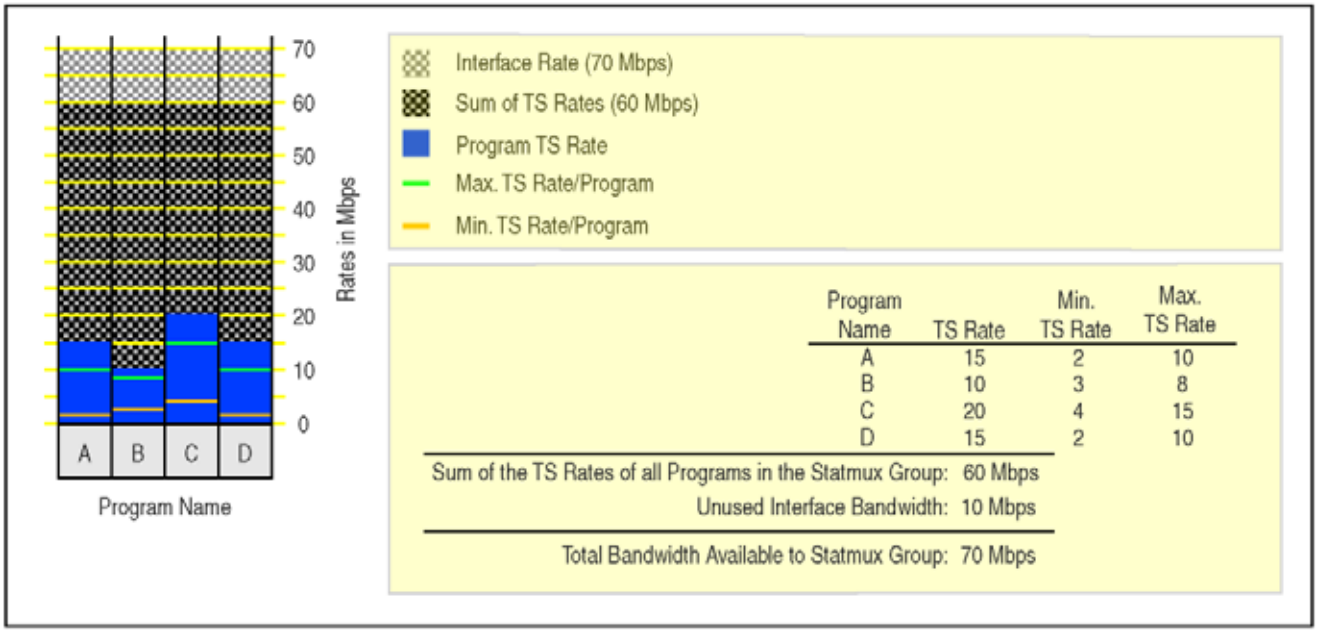


Figure 3-14 NetVX StatMux Overview

The following Mux VC parameters control and fine-tune programs in the StatMux group.

Min. Rate

This Mux VC parameter specifies the minimum rate that the program will be coded at. Use this parameter to ensure a minimum quality level. See the "Minimum Rate (Mbps)" control on page 366.

Max. Rate

This Mux VC parameter specifies the maximum rate that the program will be coded at. Use this parameter to ensure that bandwidth is not used at a rate at which it is not needed. See the "Maximum Rate (Mbps)" control on page 366.

Priority

This Mux VC parameter controls the weighting that is applied to each encoder feed. Figure 3-14 shows Programs 'A' and 'D' as having the same 'TS Rate', 'Min. Rate', and 'Max. Rate'. If program 'A' were given a 'Priority' value higher than the default value of '5', such as '2' for example, then that encoder would receive more bits. See the "Priority" control on page 366 and also the "Overview of the StatMux Priority Control" on page 101.

Related Procedure

"How To Configure StatMux for Locally-Encoded Programs" on page 104
"Overview of the StatMux Priority Control" on page 101

Related Dialog

"Config > TS Multiplexers > Interface Dialog" on page 362.

3.9.2 Overview of the StatMux Priority Control

Abstract: *This topic provides details specific to the StatMux 'Priority' control. The 'Priority' control governs the bias affecting the number of bits provided to statmux programs.*

The priority setting is available at the following locations:

- In Vidiem™: Config > TS Multiplexers > VC Control > VC Program Details Dialog
- In the NetVX Craft Port:

```
cfg slot.s/mux/mxvc.m smpriority=<1-10>
```

The 'priority' setting's user-facing values range from 'one' to 'ten'. A program assigned priority 'one' has the highest priority and is given the most bits. Internally, the system transposes these values for the purposes of calculations.

Table 3-1 External and internal Priority Values

External, User-Specified Priority Value	Internal Value Used in Computation	Relative Priority
1	10	Highest Priority
2	9	
3	8	
4	7	
5	6	
6	5	Default Priority
7	4	
8	3	
9	2	
10	1	Lowest Priority

Each program is given a priority value. 'Five' is the default priority value for programs added to a statmux group.

How to Priority Settings Affect the 'Target Bit Rate' for A Stat Mux Program

Table 3-2 StatMux Target Bit Rate Calculation Example

[1] Program	[2] Bit Rate aka: TS Rate	[3] Priority (Transposed)	[4] Priority Ratio (Priority/Sum of Priorities)	[5] Target Bit Rate (Bit Rate * Priority Ratio) aka: Target TS Rate
Program 1	20.00 Mbps	9	9/27	6.67 Mbps
Program 2	7.00 Mbps	5	5/27	1.30 Mbps
Program 3	12.00 Mbps	3	3/27	1.33 Mbps
Program 4	35.00 Mbps	10	10/27	12.96 Mbps
Total Bit Rate:	**74.00 Mbps**	**Sum of Priorities: 27**		**22.26 Mbps**

- The 'Priority' values for all programs are summed (bottom of [3]). This sum serves as the denominator of the 'Priority Ratio' (column [4]).
- The 'Bit Rate' (column [2]) is multiplied by the 'Priority Ratio' (column [4]) to derive the 'Target Bit Rate' (column [5]).
- The 'Target Bit Rate' is used as a starting point for further iterative and dynamic calculations that take into account 'Max. Rate' and 'Min. Rate' values as well.

3.9.3 Overview of Methods for NetVX StatMux

Abstract: *This topic describes various methods of performing statmux using the NetVX.*

The NetVX's TMX modules can statistically-multiplex encoded programs originating on the same NetVX system or on remote NetVX systems. See the appropriate procedure below for the kind of statmux you want to perform.

- Locally-Encoded Programs: Programs originating on encoders located in the same NetVX system. This is the 'traditional' method for creating statmux groups. The only shortcoming to this approach is that the statmux group is limited to the number of encoders that can be placed in the same NetVX system. See Section 3.9.4, "How To Configure StatMux for Locally-Encoded Programs" on page 104.
- Remotely-Encoded Programs transmitted via ASI. Programs originating on encoders located in remote NetVX systems and transmitted to the NetVX via ASI. See Section 3.9.5, "How To Configure StatMux For Distributed Programs Received over ASI" on page 106.
- Remotely-Encoded Programs transmitted via GBE. Programs originating on encoders located in remote NetVX systems and transmitted to the NetVX via GBE. See Section 3.9.6, "How To Configure StatMux For Distributed Programs Received over GBE" on page 109.
- Remotely-Encoded Programs transmitted via ATM. Programs originating on encoders located in remote NetVX systems and transmitted to the NetVX via ATM. See Section 3.9.7, "How To Configure StatMux For Distributed Programs Received over ATM" on page 112

Note: Methods described in the procedures listed above can be combined as needed. For example, a remote-encoded signal can be statmuxed with a locally-encoded signal. Those signals can be combined with a signal entering the system over ATM and/or GBE. Any combination is possible.

3.9.4 How To Configure StatMux for Locally-Encoded Programs

Abstract: *Use this procedure to apply statistical multiplexing to a group of programs originating on encoders located within the same NetVX system as the TMX module.*

Prerequisites

- For this procedure, each source contributing to the Stat Mux group must be a local encoder. 'Local Encoders' are those installed in the same system as the TMX module. Local encoders may be high-definition or standard-definition.
- A Stat Mux group can only be created on a Multiplexer associated with a Transmit Interface.
- A source encoder can multicast to up to eight destinations but only one of those destinations may be a Mux VC that is operating as part of a StatMux group (has 'Enable Stat Mux' configured to 'ON').
- The TMX's multiplexer can include both Stat Muxed and Non-Stat Muxed programs via a Mux VC.

Procedure

Use the following procedure to create a StatMux group.

1 Configure the TMX Transmit Interface
   - In the configuration tree, select 'Modules > TS Transmitters' and expand this branch.
   - Right-click on the desired 'TX interface' and select 'Properties' to open the 'Transmitter Properties' dialog.

In the Transmitter Properties Dialog…

2 Click on the name of the interface on the top level of the sub-navigation tree.

3 On the 'Interface' page...
   - Set the 'Mode' to 'TX-Only'.
   - Ensure that both the 'Enable Pass Through' and the 'Enable Loopback' controls in the 'Interface' dialog are not checked.
   - Set the 'Standard' as desired.
   - Set the 'Rate' as desired.

Note: Refer to the "Config > TS Transmitter > Interface Dialog" on page 322 for descriptions of these controls.

4 Click on 'Transport Stream' in the sub-navigation tree.
   - Choose the 'SI-PSI Mode' as desired.
   - (Optional) Specify a 'Transport Stream ID' as desired.

Create a Mux VC

5 Click on 'VC Control' in the sub-navigation tree.
   - Press the 'New' button to create a new Mux VC.
   - (Optional) Enter a tag to identify this VC.
   - Select 'Program' using the 'Function' drop down.
   - Specify the 'Program Number'. The program number identifies the program on this VC in the multiplexed multi-program transport stream (MPTS).

6 Click on 'Program, Statmux' in the sub-navigation tree.
   - Check 'Enable Stat Mux'.
   - Specify the 'Statmux Max Rate'.
   - Specify the 'Statmux Min Rate'.
   - Specify the 'StatMux Priority'.

7 Repeat Step 4 through Step 6 above to create a VC for each encoder that will contribute to the Stat Mux group.

8 Click the 'OK' button.

9 Create a cross-connection to connect each encoder with one of the Mux VCs.

10 Select 'Device > Write…' to write these changes to the system.

Note: Before going to air, experiment with live feeds that provide an accurate representation of the material you want to use.

Related Topics

- If you would like to send the multiplexed StatMux stream out of the system and over ATM or GBE then use a short coax loop to bring the Stat Mux stream back in one of the multiplexer's receive interfaces. Follow the instructions in "How to Route an ASI or 310M Input to a Demux VC (Pass Through)" on page 91 to get the stream onto the back plane for routing to the desired network interface.
- "Config > TS Multiplexers > Interface Dialog" on page 362.
- "How to Configure Default PID Values" on page 114.
- Section 3.9.3, "Overview of Methods for NetVX StatMux" on page 103.

3.9.5 How To Configure StatMux For Distributed Programs Received over ASI

Prerequisites

- A Stat Mux group can only be created on a Multiplexer associated with a Transmit Interface.
- A source encoder can multicast to up to eight destinations but only one of those destinations may be a Mux VC that is operating as part of a StatMux group (has 'Enable Stat Mux' configured to 'ON').
- The TMX's multiplexer can include both Stat Muxed and Non-Stat Muxed programs via a Mux VC.

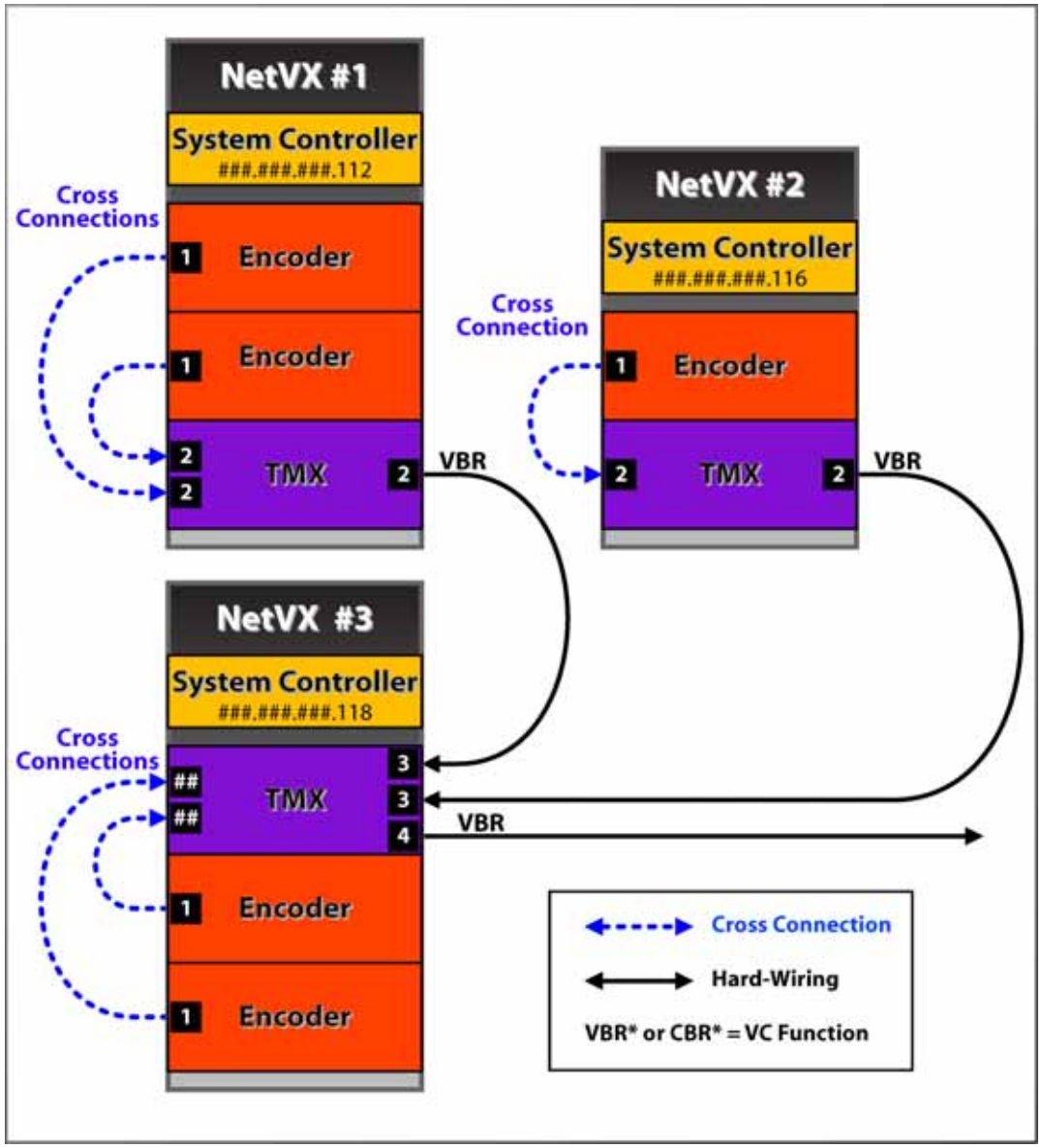


Figure 3-15 Multi-Chassis StatMux Configuration Using ASI

Procedure

Use the following procedure to create a StatMux group of distributed encoders. This procedure can support up to two remote NetVX systems each providing a multi-program transport stream.

Configure Encoders

1 Configure all encoders, in all NetVX systems, that shall contribute to the statmux group.

2 Configure each remote system to create a multiplex as directed in Section 3.8.6, "How to Multiplex VCs into an MPTS for Tx Output" on page 97.

Note: On remote NetVX systems contributing to a statmux group, the Mux VC carrying the contributing signal must have it's 'max rate' set to the rate of the entire StatMux group.

3 On the TMX performing the statmux operation, configure each receive interface to receive and to demultiplex the desired programs as described in Section 3.8.2, "How to Demultiplex an ASI or 310M MPTS" on page 92.

4 On the TMX performing the statmux operation, configure the TMX Transmit Interface.

- In the configuration tree, select 'Modules > TS Transmitters' and expand this branch.
- Right-click on the desired 'TX interface' and select 'Properties' to open the 'Transmitter Properties' dialog.

Use the 'Transmitter Properties Dialog' to Configure the Transmit Interface

5 Click on the name of the transmit interface on the top level of the sub-navigation tree.

6 On the 'Interface' page...

- Set the 'Mode' to 'TX-Only'.
- Ensure that both the 'Enable Pass Through' and the 'Enable Loopback' controls in the 'Interface' dialog are not checked.
- Set the 'Standard' as desired.
- Set the 'Rate' as desired.

Note: Refer to the "Config > TS Transmitter > Interface Dialog" on page 322 for descriptions of these controls.

7 Click on 'Transport Stream' in the sub-navigation tree.

- Choose the 'SI-PSI Mode' as desired.
- (Optional) Specify a 'Transport Stream ID' as desired.

Create One Mux VC to Receive Each Encoder's Stream

8 Click on 'VC Control' in the sub-navigation tree.

- Press the 'New' button to create a new Mux VC.
- (Optional) Enter a tag to identify this VC.
- Select 'Program' using the 'Function' drop down.
- Specify the 'Program Number'. The program number identifies the program on this VC in the multiplexed multi-program transport stream (MPTS).

9 Click on 'Program, Statmux' in the sub-navigation tree.

- Check 'Enable Stat Mux'.
- Specify the 'StatMux Priority' that this channel should have.
- Specify the 'Statmux Max Rate'.
- Specify the 'Statmux Min Rate'.
- Specify the 'IP Address' of the System Controller controlling the NetVX that contains the remote encoder.
- Specify the 'Slot' number; the number of the slot containing the encoder in the remote NetVX.

10 Repeat Step 4 through Step 6 above to create a VC for each encoder that will contribute to the Stat Mux group.

Note: A Mux VC must be created for each encoded stream that will become a part of the statmux group. Included in this group are those streams entering the Mux through it's receive ports, as well as local encoders in the same NetVX system.

11 Click the 'OK' button.

12 Create a cross-connection to connect each one of the Demux VCs to one of the Mux VCs.

13 Select 'Device > Write…' to write these changes to the system.

Note: Before going to air, experiment with live feeds that provide an accurate representation of the material you want to use.

Related Topics

- If you would like to send the multiplexed StatMux stream out of the system and over ATM or GBE then use a short coax loop to bring the Stat Mux stream back in one of the multiplexer's receive interfaces. Follow the instructions in "How to Route an ASI or 310M Input to a Demux VC (Pass Through)" on page 91 to get the stream onto the back plane for routing to the desired network interface.
- "Config > TS Multiplexers > Interface Dialog" on page 362.
- "How to Configure Default PID Values" on page 114.
- See Section 3.9.4, "How To Configure StatMux for Locally-Encoded Programs" on page 104.

3.9.6 How To Configure StatMux For Distributed Programs Received over GBE

Abstract: *Use this procedure to statistically-multiplex program streams originating on encoders located in remote NetVX systems and transmitted to the NetVX via GBE.*

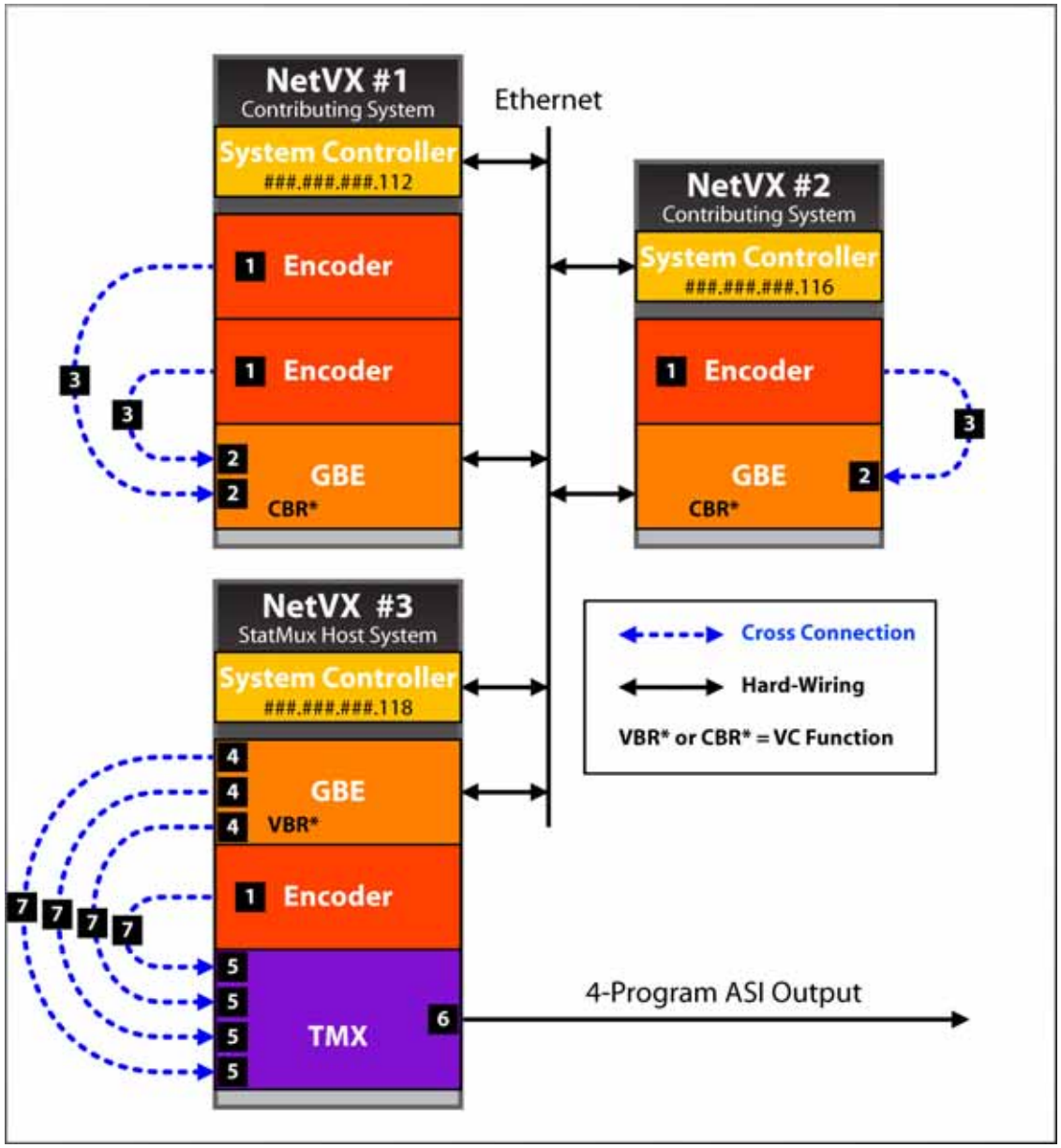


Figure 3-16 Multi-Chassis StatMux Configuration Using GBE

Prerequisites

- A GBE module must be located in each system that has an encoder that shall contribute to the statmux group.
- Each GBE and system controller module must be able to communicate with every other system controller and GBE module.

Configure Each Contributing System

1 Configure each encoder that shall contribute to the statmux group.

2 On each GBE module in a NetVX contributing system, create one VC for each encoder.

3 In each NetVX contributing system, cross connect each encoder to a VC created in the previous step.

Configure the StatMux Host System

4 On the GBE in the NetVX 'StatMux Host System' configure one VC to receive each remote encoder providing input to the statmux group.

5 On the TMX performing the statmux operation, create a Mux VC to receive the signal from each VC created in the preceding step, and one VC for each (if any) local encoder contributing to the StatMux group.

6 On the TMX performing the statmux operation, configure the TMX Transmit Interface.
- In the configuration tree, select 'Modules > TS Transmitters' and expand this branch.
- Right-click on the desired 'TX interface' and select 'Properties' to open the 'Transmitter Properties' dialog.

7 Click on the name of the desired transmit interface on the top level of the sub-navigation tree.

8 On the 'Interface' page...
- Set the 'Mode' to 'TX-Only'.
- Ensure that both the 'Enable Pass Through' and the 'Enable Loopback' controls in the 'Interface' dialog are not checked.
- Set the 'Standard' as desired.
- Set the 'Rate' as desired.

Note: Refer to the "Config > TS Transmitter > Interface Dialog" on page 322 for descriptions of these controls.

9 Click on 'Transport Stream' in the sub-navigation tree.
- Choose the 'SI-PSI Mode' as desired.
- (Optional) Specify a 'Transport Stream ID' as desired.

Create One Mux VC to Receive Each Encoder's Stream

10 Click on 'VC Control' in the sub-navigation tree.
- Press the 'New' button to create a new Mux VC.
- (Optional) Enter a tag to identify this VC.
- Select 'Program' using the 'Function' drop down.
- Specify the 'Program Number'. The program number identifies the program on this VC in the multiplexed multi-program transport stream (MPTS).

11 Click on 'Program, Statmux' in the sub-navigation tree.
- Check 'Enable Stat Mux'.
- Specify the 'StatMux Priority' that this channel should have.
- Specify the 'Statmux Max Rate'.
- Specify the 'Statmux Min. Rate'.
- Specify the 'IP Address' of the System Controller in the NetVX Contributing System containing the remote encoder.
- Specify the 'Slot' number; the number of the slot containing the encoder in the remote NetVX.

12 Repeat Step 10 through Step 11 above to create a Mux VC for each encoder that will contribute to the Stat Mux group.

Note: A Mux VC must be created for each encoded stream that will become a part of the statmux group. Include in this group those streams entering the Mux through it's receive ports, as well as any local encoders in the same NetVX system.

13 Click the 'OK' button.

14 Create cross-connections linking each Demux VCs to a Mux VCs.

15 Select 'Device > Write…' to write these changes to the system.

Note: Before going to air, experiment with live feeds that provide an accurate representation of the material you want to use.

Related Topics

- If you would like to send the multiplexed StatMux stream out of the system and over ATM or GBE then use a short coax loop to bring the Stat Mux stream back in one of the multiplexer's receive interfaces. Follow the instructions in "How to Route an ASI or 310M Input to a Demux VC (Pass Through)" on page 91 to get the stream onto the back plane for routing to the desired network interface.
- "Config > TS Multiplexers > Interface Dialog" on page 362.
- "How to Configure Default PID Values" on page 114.
- Section 3.9.4, "How To Configure StatMux for Locally-Encoded Programs" on page 104.

3.9.7 How To Configure StatMux For Distributed Programs Received over ATM

Abstract: *Use this procedure to statistically-multiplex program streams originating on encoders located in remote NetVX systems and transmitted to the NetVX via ATM.*

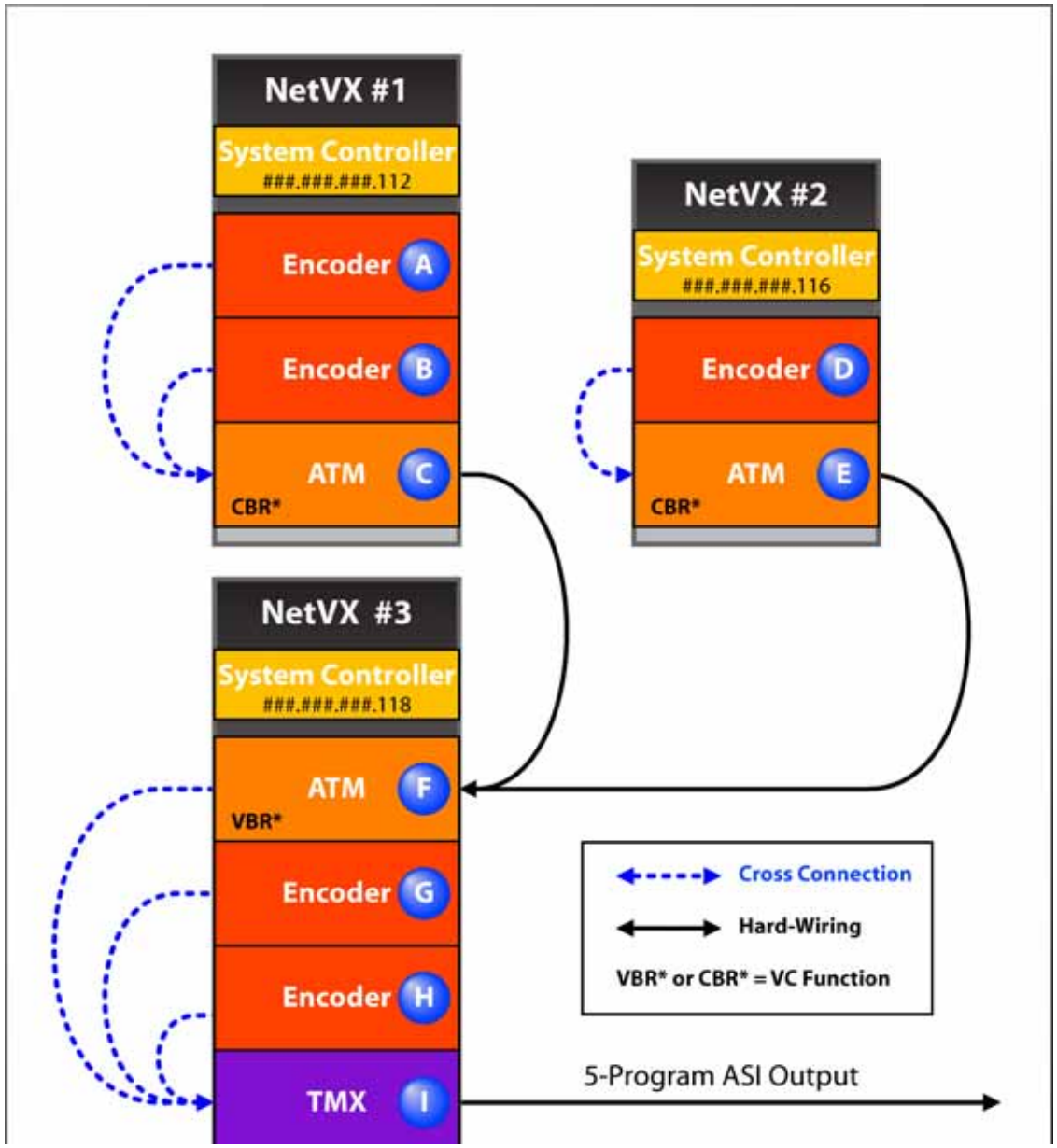


Figure 3-17 Multi-Chassis StatMux Configuration Using ATM

Configure Encoders

1 Configure each encoder that shall contribute to the statmux group.

On each NetVX Contributing System...

2 Create one VC on the ATM module for each encoder.

3 Create cross-connections linking each encoder to an ATM VC.

On the NetVX StatMux Host System...

4 On the ATM module, create one VC for each contributing encoder.

5 On the TMX performing the statmux operation, configure the TMX Transmit Interface.
- In the configuration tree, select 'Modules > TS Transmitters' and expand this branch.
- Right-click on the desired 'TX interface' and select 'Properties' to open the 'Transmitter Properties' dialog.

Use the 'Transmitter Properties Dialog' to Configure the Transmit Interface

6 Click on the name of the transmit interface on the top level of the sub-navigation tree. On the 'Interface' page...
- Set the 'Mode' to 'TX-Only'.
- Ensure that both the 'Enable Pass Through' and the 'Enable Loopback' controls in the 'Interface' dialog are not checked.
- Set the 'Standard' as desired.
- Set the 'Rate' as desired.

Note: Refer to the "Config > TS Transmitter > Interface Dialog" on page 322 for descriptions of these controls.

7 Click on 'Transport Stream' in the sub-navigation tree.
- Choose the 'SI-PSI Mode' as desired.
- (Optional) Specify a 'Transport Stream ID' as desired.

Create One Mux VC to Receive Each Encoder's Stream

8 Click on 'VC Control' in the sub-navigation tree.
- Press the 'New' button to create a new Mux VC.
- (Optional) Enter a tag to identify this VC.
- Select 'Program' using the 'Function' drop down.
- Specify the 'Program Number'. The program number identifies the program on this VC in the multiplexed multi-program transport stream (MPTS).

9 Click on 'Program, Statmux' in the sub-navigation tree.
- Check 'Enable Stat Mux'.
- Specify the 'StatMux Priority' that this channel should have.
- Specify the 'Statmux Max Rate'.
- Specify the 'Statmux Min. Rate'.
- Specify the 'IP Address' of the System Controller controlling the NetVX that contains the remote encoder.
- Specify the 'Slot' number; the number of the slot containing the encoder in the remote NetVX.

10 Repeat Step 4 through Step 6 above to create a VC for each encoder that will contribute to the Stat Mux group.

Note: A Mux VC must be created for each encoded stream that will become a part of the statmux group. Included in this group are those streams entering the Mux through it's receive ports, as well as local encoders in the same NetVX system.

11 Click the 'OK' button.

12 Create one cross-connection to connecting each ATM VC to a Mux VCs.

13 Select 'Device > Write…' to write these changes to the system.

Note: Before going to air, experiment with live feeds that provide an accurate representation of the material you want to use.

Related Topics

- If you would like to send the multiplexed StatMux stream out of the system and over ATM or GBE then use a short coax loop to bring the Stat Mux stream back in one of the multiplexer's receive interfaces. Follow the instructions in "How to Route an ASI or 310M Input to a Demux VC (Pass Through)" on page 91 to get the stream onto the back plane for routing to the desired network interface.

3.9.8 How to Configure Default PID Values

Abstract: *Use this procedure to configure the default PID values that are applied to encoders and demultiplexes programs.*

Default PID values are applied when an interface's PID Map control is set top 'Automatic'.

Note: The NetVX maps PIDS automatically by default. Under normal operating conditions there is no need to alter the automatically assigned default PID values. However, beginning with release 6.0 a PID mapping facility is provided for expert users who desire specific program stream elements to always be mapped to specific PIDs.

1. Right-click on 'System' in the configuration tree and select 'Properties'.
2. Expand the 'Fundamentals' branch of the sub-menu tree and click on 'Program'.
3. Check the 'I acknowledge this notice' checkbox.
4. Alter any and all default PID values as desired.
5. Click 'OK' to dismiss the dialog.
6. Select 'Device > Write…' to write these changes to the system.

Related Topics

- The description of the 'PID Map' control provides detailed information about how 'Automatic' and 'Manual' PID mapping are configured. The PID Map control is described in "Config > TS Multiplexers > VC Control > Program, PID Mapping Dialog" on page 368.
- "How to Manually Map VC PID Values on a Mux Interface" on page 115
- "How to Multiplex VCs into an MPTS for Tx Output" on page 97.
- "Telnet PasswordHow to Multiplex VCs into an MPTS for Internal Use" on page 99.

3.9.9 How to Manually Map VC PID Values on a Mux Interface

Abstract: *Use this procedure to manually configure transport stream PID values on one or more Mux VCs on a TS Transmitter or TS Multiplexer interface.*

Note: The NetVX maps PIDS automatically by default. Under normal operating conditions there is no need to manually map PID values. However, beginning with release 6.0 a PID mapping facility is provided for expert users who desire specific program stream elements to be placed on specific PIDs.

1. This procedure requires at least one existing Mux VC.
2. Expand the desired 'TS Multiplexer' or 'TS Transmitter' interface branch in the configuration tree.
    - Select 'Modules > (double-click) TS Transmitters' or...
    - Select 'Modules > (double-click) TS Multiplexers'
3. Right-click on the desired interface and select 'Properties' to open the 'TS Multiplexer Properties' dialog.
4. * The two bulleted steps immediately below apply only to TS Transmitter Interfaces. *
    - Set the 'Mode' control drop to 'Tx Only'.
    - Disable (uncheck) the 'Enable Passthrough' control.
5. Expand the 'VC Control' branch of the sub-navigation tree and click on 'VC Program'.
6. Highlight the VC on which you want to manually configure PIDs.
7. Check the 'I acknowledge this notice' checkbox.
8. Select 'Manual' in the 'PID Map' drop down. This selection affects other VCs on this interface!

Note: The 'Manual' PID Map selection affects all VCs on the selected interface. Therefore once this selection is made, the PID values for every other VC on the interface must be manually as well.

9. Specify PID values in the fields provided.
10. Highlight any other VCs and specify PID values.
11. Click 'OK' to dismiss the dialog.
12. Select 'Device > Write…' to write these changes to the system.

Related Topics

- The description of the 'PID Map' control provides detailed information about how 'Automatic' and 'Manual' PID mapping are configured. The PID Map control is described in "Config > TS Multiplexers > VC Control > Program, PID Mapping Dialog" on page 368.
- "How to Configure Default PID Values" on page 114
- "How to Multiplex VCs into an MPTS for Tx Output" on page 97.
- "Telnet PasswordHow to Multiplex VCs into an MPTS for Internal Use" on page 99.

3.9.10 How to Configure the NetVX to Use Conditional Access

Abstract: *NetVX firmware version 8.3.0 introduces the Simulcrypt feature. This procedures describes how to configure the NetVX to create one scrambled service on a single transport stream.*

The following diagram indicates the necessary connections and relationships between a NetVX and related conditional access equipment. In advance of attempting this procudeure, please study this diagram and ensure your system's environment (wiring, IP subnetting, etc) is similar what is shown here.

1 Create an entry for a **Conditional Access System (CAS)**...

1a Click 'Config > System' and right-click on 'CA Systems > Properties'.

1b In the 'CA System Properties' dialog, click the 'New' button.

- Give CA System a tag name if desired.
- Set the 'System ID' to match the CA system server.

1c (optional) Repeat steps 1b through 1d for each conditional access system.

1d Do not click the 'OK' button! Go on to the next step intead.

2 On the system created above, configure the connection to the **Entitlement Control Message Generator (ECMG)**.

2a Double-click on the 'CA Systems' branch, and double-click the 'ECM Generators' sub-branch.

2b In the 'ECMG Properties' dialog...

- Use the 'System' drop down (if necessary) to select the desired CA System (typically the one created in Step 1 above)
- Click the 'New' button to create a new ECMG entry.
- Set the 'Sub CA System ID'. This number should be unique for a set of ECMGs under a CAS to uniquely ID the ECMG/CAS to the SCS. This number is combined with the System ID set in step 1.
- Set the 'Transport Stream ID' of the stream for which the ECMG will generate ECMs.
- Set the 'IP Address' and 'IP Port' to match the ECMG configuration on the CAS.

3 Configure the **Entitlement Management Message (EMM)** source.

3a Double-click on the 'CA Systems' branch, and double-click the 'EMM Generators' sub-branch.

3b In the 'EMMG Properties' dialog...

- Use the 'System' drop down (if necessary) to select the desired CA System (typically the one created in Step 1 above)
- Click the 'New' button to create a new EMMG entry.
- Assign the EMMG to the desired transport stream where the EMM traffic will play out.
- Assign a maximum data rate to the EMM stream. This value is typically 100-200 Kbit/sec.
- Set the 'EMM Protocol.' This protocol must be the same as is configured on CAS.
- Set the 'IP Address' where the EMM source is originating (CAS server typically).
- Set the 'TCP port' to the port configured for EMMs on the CAS.
- (OPTION) If using UDP data delivery set the 'UDP port.'

Note: Make sure enough over-head is allocated to the transport interface rate to accommodate the max EMM rate.

4 Configure the **CA Scrambling Control Group (CA SCG)**.

4a Double-click on the 'CA Scrambling Control Groups' branch, then double-click the 'CA SCG' sub-branch.

4b In the 'CA SCG' dialog...

- Click the 'New' button to create a new CS SCG entry.
- Specify a 'Tag' for the CA SCG. A good practice is to match the 'Service Name' on the CAS.
- Set the 'Crypto Period' (seconds) as desired; for example 30 seconds.
- Assign the 'Transport Stream ID'. Coordinate this value to match that of the TSID of the MUX interface which hosts the VC referencing the SCG.

5 Configure **Entitlement Control Message (ECM)** settings.

5a Double-click on the 'CA Scrambling Control Groups' branch, then double-click the 'CA SCG' sub-branch.

5b In the 'CA Properties' dialog, expand the 'CA SCG' branch and click the 'ECM' sub-branch.

- Click the 'New' button to create a new ECM entry.
- Assign a 'PID' to the ECM.
- Assign a 'Service ID' to the SCG. This value is typically the program number on the TS but it can be different. It *must* match the Service ID on the CAS.
- Specify the 'System Index'.

6 On the System Controller (slot 1), create a VC on the IP interface.

6a This VC muxt have the following attributes.

- Set the function of 'CA-RX'.
- Set the 'IP Address' and 'Port' must to '0.' The VC does not directly receive data over IP, but is instead used as a cross-connectioon source for the EMM stream from System Controller to the MUX interface.

7 Create VC on the desired MUX interface where the EMM data will be multiplexed.

- Set this VC's function to 'CA'.

8 Create cross-connection between the System Controller VC and MUX VC created in steps 6 and 7 above.

9 Create another VC on same MUX interface.

- Set the VC's function to 'Program.'
- Set the VC's encryption-mode to 'Simulcrypt.'

10 Configure **MUX Interface** with the following attributes.

- Set 'SI Mode' to 'DVB'.
- Set 'Transport Stream ID (TSID)' to a unique value across all transports being controlled using Simulcrypt. Note: The TSID must match TSID on the CAS that the service is assigned to.
- Set 'Network ID' to match that on the CAS.
- Set the data rate well enough above the program rate to account for allocated bandwidth of the EMM and ECM data.

11 Create an SCR VC on the **Scrambler** slot.

12 Expand the 'Modules > Scramblers' branch of the navigation tree. Double-click the 'Scramblers' VC.

12a In the 'SCR Properties' dialog...

- Specify the 'Program Number.'
- Specify the 'Simulcrypt Scrambling Control Group.'
- Set the Encryption Mode to Simulcrypt. No SI mode is present on the SCR VCs. Setting the VC's encryption mode to Simulcrypt will pass through the common DVB PIDs for the EIT, NIT, SDT and TDT

13 Cross connect program source, say an encoder, to the Scrambler VC created in step 12.

14 Cross connect the Scrambler VC output to the MUX program VC created above.

Related Topics

"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG Dialog" on page 225.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG > ECM Dialog" on page 226.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System Dialog" on page 227.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > ECMG Dialog" on page 228.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > EMMG Dialog" on page 228.
"Config > Scramblers > SCR Properties Dialog" on page 373.

3.9.11 How to Add BISS Conditional Access to a Transport Stream

Abstract: *Use this procedure to add conditional access to a program stream.*

1 Create multiplex as directed in "How to Multiplex VCs into an MPTS for Tx Output" on page 97.
2 On the interface carrying the multiplex, expand the TMX interface type (below) in the configuration tree.
   - Select 'Modules > TS Transmitters' or...
   - Select 'Modules > TS Multiplexers' or...
3 Right-click on the desired interface and select 'Properties' to open the 'Interface' dialog.
4 Create a new BISS VC.
   4a Click on the 'VC Control' in the sub-navigation tree.
   4b Click the 'New' button to create a new VC.
   4c Use the 'Function' drop down to select 'Conditional Access'.
   4d Expand the 'VC Control' branch of the sub-navigation tree and click on 'Program, Scrambling'.
   4e Use the 'Encryption Mode' drop-down to select the 'BISS' option.
   4f Enter the decoder's 'Injected Identifier' in the text box.
   4g Specify the Session Word; a 12-character, hexadecimal string, such as 0a3b5c7d9e1f (upper-case and lower-case letters allowed), or use the 'New' button, described below, to generate this string.
   4h (Optional) Check the 'Include in Global Scrambler List' to add the TMX and its 'Session Word' to the global 'Scramblers' list. The global 'Scramblers' list appears in the drop down at the top of the 'BISS Keys Dialog".
5 Click 'OK' to dismiss the dialog.
6 Select 'Device > Write…' to write these changes to the system.

Related Topics

"How to Drop Conditional Access from a Program Stream" on page 118.

3.9.12 How to Drop Conditional Access from a Program Stream

Abstract: *Use this procedure to drop Conditional Access (CA) from a program stream and avoid sending the CA information to 'downstream' equipment.*

1 Use either of the procedures below to configure either a Mux or Demux VCs to carry a program stream.
   - "How to Demultiplex an ASI or 310M MPTS" on page 92.
   - "How to Multiplex VCs into an MPTS for Tx Output" on page 97.
2 Expand the desired TMX interface type (below) in the configuration tree.
   - Select 'Modules > TS Transmitters' or...
   - Select 'Modules > TS Receivers' or...
   - Select 'Modules > TS Multiplexers' or...
   - Select 'Modules > TS Demultiplexers'.
3 Right-click on the desired interface and select 'Properties' to open the 'Interface' dialog.
4 Click on the 'VC Control' in the sub-navigation tree.
5 Highlight the desired VC in the list of VC 'Entries'.
6 Place a check mark in the 'Drop Conditional Access' checkbox.
7 Click 'OK' to dismiss the dialog.
8 Select 'Device > Write…' to write these changes to the system.

Related Topics

"How to Add BISS Conditional Access to a Transport Stream" on page 118.

3.10 TMX: Opportunistic Data Overview and Procedure

3.10.1 Overview of Opportunistic Data

TMX modules' transmit interfaces can produce either 'variable-bitrate' or 'constant-bitrate' streams, depending on the configured standard. Constant-bitrate streams normally have null packets inserted to bring the bitrate up to the interface's specified value. The TMX Opportunistic Data application replaces these null packets with useful data.

The following rules apply to Opportunistic Data insertion:

- Opportunistic Data insertion only operates on TMX transmit interfaces. Although substantially similar, internal multiplex interfaces do not support opportunistic data.
- Each TMX transmit interface can have only one VC with a 'function' set to 'opportunistic-data'. This VC supplies packets that replace null packets within the stream. Note: Some null packets may remain in the stream if insufficient opportunistic data is available to replace them.
- Conceptually the opportunistic data stream resembles a program. Except as noted, opportunistic VCs are treated the same as program channels.
- A TMX VC configured with the 'function' of 'opportunistic data' can have either a 'zero' or a 'non-zero' program number. A 'Program' of zero avoids all PID remapping for the VC. When using this setting, the supplier of opportunistic data must ensure that the VC's PIDs do not conflict with those of any other VC on the interface.
- A non-zero 'Program' value indicates the VC's stream is a complete program. The interface applies its normal program handling – the channel is given a PAT entry and the VC's PIDs are remapped.
- An Opportunistic Data VC carries flow control messages following SMPTE 325M-1999, Opportunistic Data Broadcast Flow Control. This flow control channel carries transport stream and can be connected to any transport stream destination. Often, a server supplies the opportunistic data stream, and the flow control messages are routed back to that server. A common connection would be an IP channel, but servers could support other interfaces.

3.10.2 How to Configure Opportunistic Data Insertion

Abstract: *Use this procedure to include a stream of opportunistic data in a transport stream multiplex transmitted through a TMX Tx interface.*

Prerequisites

Opportunistic Data insertion requires the following items in addition to the NetVX.

- A TMX Module.
- A GBE Module.
- An Opportunistic Data Server.
- Ethernet Connectivity between the NetVX GBE module and the Opportunistic Data Server.

Procedure

1 Create multiplex as directed in "How to Multiplex VCs into an MPTS for Tx Output" on page 97.

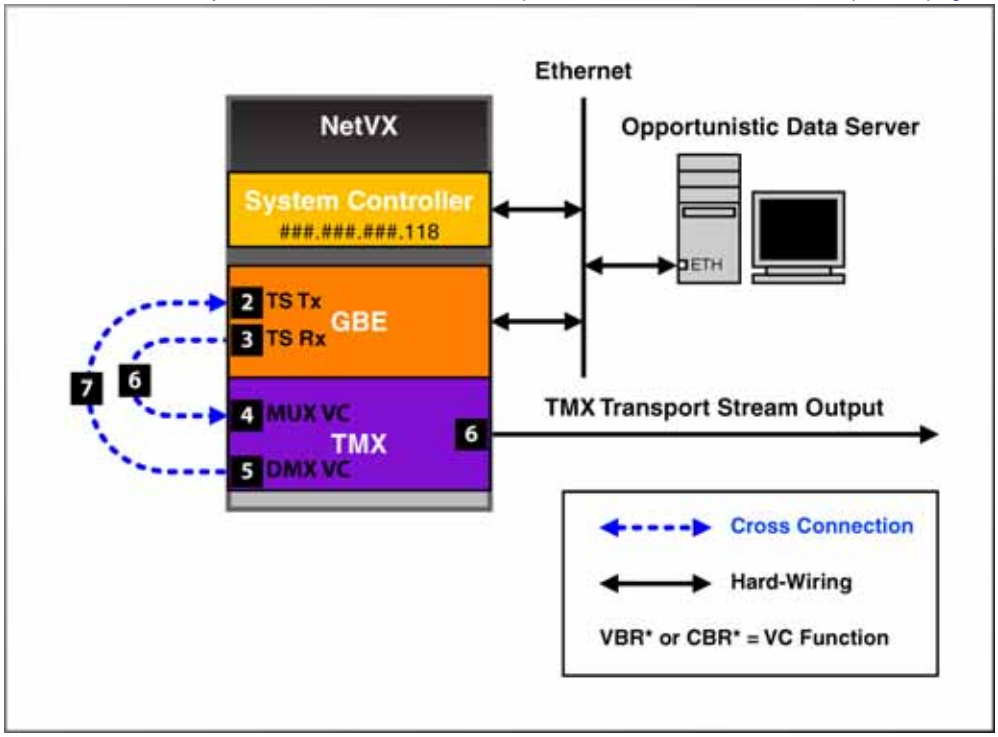


Figure 3-18 NetVX Opportunistic Data Wiring and Connection Configuration

2 On the GBE module, create a VC with the function 'TS Tx'. This VC routes flow control data back to the Opportunistic Data Server.
- In the 'IP Properties' dialog, click on the 'MPEG Tx Network' sub-menu branch.
- In the 'MPEG Tx, Network' dialog, enter the 'IP Address' and (if required) the 'UDP Port' of the Opportunistic Data Server.
- Last configure the 'Payload Rate' and (if desired) 'Type of Service'.

3 On the GBE module, create a second VC with the function 'TS Rx'. This VC receives data from the Opportunistic Data Server.

4 On the TMX module, create a MUX VC with the function 'Opportunistic Data'. This VC receives data from the GBE VC created in Step 2.

Note: When a VC is assigned the function 'Opportunistic Data', Vidiem automatically creates a correlating DMX VC. This VC is necessary to route flow control data back to the Opportunistic Data server.

5 Configure the DMX VC created in Step 4.
- Close the 'TS Transmitters' dialog.
- Click on the 'Demultiplexer VC' tab, then double-click on white row of the table which represents the VC labelled 'Flow Control'.

6 Create Cross Connections in the Vidiem™ navigation tree.
- Drag and drop the DMX VC created in Step 4 on the GBE Tx VC created in Step 2 to create a cross connection.
- Drag and drop the GBE Rx VC created in Step 3 on the MUX VC created in Step 4 to create a cross connection.

7 Select 'Device > Write' from the menu bar.

3.11 TMX: PSIP and Data Carousel Procedures

3.11.1 How to Use the Carousel Builder to Create Carousel Files

Abstract: *Use this procedure to create carousel files to be manually loaded on the NetVX.*

Prerequisites

This procedure requires the following two XML files. Please contact technical support for documentation on the data structure of these files.

- XML File for Fixed SI Tables
- XML File for PSI Tables.

Procedure

1. From Vidiem™'s menu bar, select 'Tools > Carousel...'.
2. In the Carousel Dialog, select 'Carousel Builder' from the sub-navigation menu.
3. In the 'Carousel Builder' dialog
   - **3a** Paste a path, or click the respective 'Open' button to point to the following XML files.
     - XML File for Fixed SI Tables
     - XML File for PSI Tables.
   - **3b** Specifiy the 'Activation Time'; the time at which the file shoud go into affect.
   - **3c** Click the 'Save As' button to specify the 'Output Carousel File' name and location.
   - **3d** Click the 'Build' button to create the carousel file. If the build process completes successfully, the files is saved at the spaecified location. Otherwise the 'Message Log' will display parse errors.
   - **3e** See the next topic, "How to Use the Carousel Loader to Load Carousel Files" on page 122 for details on loading this file onto the system.

Related Topics

"Tools > Carousel > Carousel Builder" on page 58.
"Tools > Carousel > Carousel Loader" on page 58.
"How to Use the Carousel Loader to Load Carousel Files" on page 122.
"How to Configure Carousel Directories and Files" on page 125.
"How to Enable the Data Carousel for Operation" on page 127.

3.11.2 How to Use the Carousel Loader to Load Carousel Files

Abstract: *Use this procedure to load carousel files onto the NetVX.*

Prerequisites

1. This procedure requires a system configured to stream ISDB-Tb. See "TMX: ISDB-Tb-Related Procedures" on page 128 for detailed procedures.
2. This procedure requires a carousel (.csl) file which can be created by following the procedure "How to Use the Carousel Builder to Create Carousel Files" on page 122.

Procedure

1. From Vidiem™'s menu bar, select 'Tools > Carousel...'.
2. In the Carousel Dialog, select 'Carousel Loader' from the sub-navigation menu.
3. In the 'Carousel Loader' dialog.

3a Paste a path, or click the ‘Open’ button to point to a carousel file.

3b Specifiy the onto which the Carousel file will be loaded.

3c Specify the slot containing the MUX module which shall stream the carousel file.

3d Specify the ‘Interface’ which shall stream the carousel file.

- The target interface should be oneof the MUX module’s internal interfaces operating in MPEG mode. These interface have their own branch named ‘TS Multiplexers’ in Vidiem™’s navigation tree. Note which interface you use and (if it is not already) be sure to cross connect that interface to a VC on the externally-facing TS Transmitter interface whcih is creating the stream going to your transmitter.

3e Click the ‘Upload’ button to upload the file to the system.

Related Topics

"Tools > Carousel > Carousel Builder" on page 58.
"How to Use the Carousel Builder to Create Carousel Files" on page 122.
"Tools > Carousel > Carousel Loader" on page 58.
"How to Configure Carousel Directories and Files" on page 125.
"How to Enable the Data Carousel for Operation" on page 127.

3.11.3 How to Multiplex PSIP Data into a Transport Stream

Abstract: *Use this procedure to multiplex PSIP data into a NetVX transport stream created by the TMX module.*

1 Configure the PSIP server to stream PSIP data.
   - Note the IP address of the PSIP server.
   - Note the UDP port that the PSIP server is configured to use.

2 Create an IP VC on an IP Module (SYS-G10, SYS-A10, or GBE-C11). This VC receives data from the PSIP server via the IP network.
   - In the configuration tree, right-click on the IP Module on which you want to create the VC.
   - Select 'Properties'.
   - Click on 'VC Control' in the sub-tree to open the 'VC Control' dialog.
   - Click the 'New' button.
   - Set the VC 'Function' to 'MPEG TS Rx'.
   - Set the 'IP Address' to that of the PSIP server.
   - Set the 'UDP Port' to the port configured on the PSIP server.
   - Click 'OK'.

3 Create a Mux VC on a TS Transmitter. This VC receives PSIP data, via a cross connection, from the IP VC created in the previous step. This VC is multiplexed with data received from all other Mux VCs on the selected TS Transmitter.
   - In the configuration tree, right-click on the 'TS Transmitters' interface on which you want to create the VC.
   - Select 'Properties'.
   - Click on 'VC Control' in the sub-tree to open the 'VC Control' dialog.
   - Click the 'New' button.
   - Set the 'Program Number' to '0'.
   - Click 'OK'.

4 Configure the TS Transmitter Interface for PSIP. Click on 'Interface' in the TS Transmitter properties sub-tree
   - In the configuration tree, right-click on the TS Transmitters interface selected in step 3.
   - Select 'Properties'.
   - Double-click to expand the 'Interface…' branch in the sub-tree.
   - Click on the 'Transport Stream' branch.
   - Set the 'SI-SPI Mode' to 'None'.
   - Click 'OK'.

5 Select 'Device > Write' from the menu bar. Hereafter, the NetVX multiplexes the PSIP data it receives.

Special Note for Some PSIP Applications

Please read the following section if the above configuration does not work.

Problem

The IP processing sub-system in some PSIP generators will verify that the IP address to which SNMP messages are sent matches the IP address from which SNMP response messages are received. When a PSIP generator transmits SNMP data across an IPOA connection, it targets the destination system's system controller module. However, when the system controller sends its SNMP response back through the IPOA connection, its LIS address - rather than its system controller IP address - appears as the packet source. In this case, when the sending and receive from IP addresses do not match some PSIP generators fail to successfully transmit PSIP data into the stream.

Workaround

On the PSIP server, change the IP address of the target system controller to the system's LIS address.

3.11.4 How to Configure Carousel Directories and Files

Abstract: *Use this procedure to configure and prove-out an approach and directory structure for handling carousel files. Once completed, use the paths specified to configure a PSIP server, FTP server, or an automation control system, to automatically FTP carousel files to the* NetVX.

1 Select "Modules > (right click) Properties" in the navigation tree.

2 Install the TMX-M12 module and configure any Mux or Transmit interfaces, Mux VCs, etc. as desired.

3 Establish an FTP connection to the NetVX.

```
ftp <ip address>
                    ex:   ftp 10.40.150.101
```

4 Log into the system's carousel directory using the following (fixed) username and password.

```
login: carousel
password: carousel
```

5 Use the 'mkdir' command to create directories to receive the carousel files. The created directory structure must have two levels.

- The parent-level directory is named after the slot (see example below) in which the TMX-M12 is located.
- The child-level directory is named after the interface used to stream the PSIP files.

5a Use the MKDIR command with a full path to simultaneously create a directory for the slot in which the TMX-M12 is located, and a nested directory for the interface.

Note: Note the expression used for each type of interface below and in the following steps.

```
ftp> mkdir slot<3-17>/mxifc<1-8>
                    ex:   ftp> mkdir slot5/mxifc7
ftp> mkdir slot<3-17>/txifc<1-2>
                    ex:   ftp> mkdir slot5/txifc2
```

6 Create one or more PSIP files using a third-party PSIP server.

7 The carousel file is binary, so before each transfer, be sure to configure the FTP client to operate in binary mode.

```
ftp> bin
```

8 For each PSIP file, use the FTP 'put' command to manually copy the file(s) to the NetVX directory associated with the desired interface.

```
ftp> put <localdirname>/<filename> slot<3-17>/mxifc<1-8>/<filename>
                    ex:   ftp> put c:/carouselfiles/monday.tmp slot5/mxifc7/monday.tmp
ftp> put <localdirname>/<filename> slot<3-17>/txifc<1-2>/<filename>
                    ex:   ftp> put c:/carouselfiles/monday.tmp slot5/txifc2/monday.tmp
```

9 Use the "ls" command and the full path to verify file are located in the desired directory.

```
ftp> ls slot<3-17>/mxifc<1-8>
                    ex:   ftp> ls slot5/mxifc7
ftp> ls slot<3-17>/txifc<1-2>
                    ex:   ftp> ls slot5/txifc2
```

10 Rename the carousel file to 'update.bin' to make it active.

```
ftp> rename slot<3-17>/mxifc<1-8> <filename.bin> update.bin
                    ex:   ftp> rename slot5/mxifc7/monday.tmp update.bin
ftp> rename slot<3-17>/txifc<1-2> <filename.bin> update.bin
                    ex:   ftp> rename slot5/txifc2/monday.tmp update.bin
```

About once a minute, the system checks for any file named 'update' in the carousel directory. When such a file is located, the system validates the file. If the file is valid, it is renamed to 'next' and read into memory. Upon reaching the 'next' file's start time, the 'current' file is deleted. The 'next' file is renamed to 'current' and is multiplexed into the transport stream. See the next section for details on configuring the carousel.

Related Topic

"Tools > Carousel > Carousel Builder" on page 58.

"How to Use the Carousel Builder to Create Carousel Files" on page 122.

"Tools > Carousel > Carousel Loader" on page 58.

"How to Use the Carousel Loader to Load Carousel Files" on page 122.
"How to Configure Carousel Directories and Files" on page 125
"How to Enable the Data Carousel for Operation" on page 127.

3.11.5 How to Enable the Data Carousel for Operation

Prerequisites

Complete the procedure described above in "How to Configure Carousel Directories and Files" on page 125.

Procedure

1 Open the dialog that is appropriate for the interface that you are using.
   - TS Transmitter Properties – In the menu tree, select 'Modules > TS Transmitters' and double-click on the desired interface.
   - TS Multiplexer Properties – In the menu tree, select 'Modules > TS Multiplexers' and double-click on the desired interface.

The rest of this procedure is the same for both interface types.

2 Check the 'Enable Carousel Streaming' checkbox.
3 Set the 'Data Carousel Rate'.
4 Click 'OK' to close the dialog.
5 Select 'Device > Write' from the menu bar.

Related Topic

"Tools > Carousel > Carousel Builder" on page 58.
"How to Use the Carousel Builder to Create Carousel Files" on page 122.
"Tools > Carousel > Carousel Loader" on page 58.
"How to Use the Carousel Loader to Load Carousel Files" on page 122.
"How to Configure Carousel Directories and Files" on page 125
"How to Enable the Data Carousel for Operation" on page 127.

3.12 TMX: ISDB-Tb-Related Procedures

3.12.1 How to Configure the TMX to Support ISDB-Tb

Abstract: *ISDB-Tb is a transmission standard used in Brazil to simultaneously transmit a video stream to both mobile video-enabled handsets and to fixed television receivers and set-top boxes. Use this procedure to configure a NetVX system to provide an ISDB-Tb-compliant signal to a transmitter. This procedure references only those parameters and values that are critical to operate ISDB-Tb; other parameters may be required to complete the configuration process.*

Hardware Requirements

1. IMPORTANT! The ISDB-Tb application requires a TMX-M12 multiplexer module.
2. The ISDB-Tb application also requires two encoders:
    - An ENC-A11 to support the 'ISDB-Tb, Mobile' SD video stream.
    - An ENC-A21 to support the 'ISDB-Tb, Fixed' video stream. This module can operate in either SD or HD mode.

Configuration Overview

This is a high-level overview of the configuration procedure.

1. Configure the TMX module's transmitter interface for ISDB-Tb.
    - Configure the modulation scheme and it's details.
    - Configure each hierarchy and determine how much bandwidth is available for each.
2. Create two VCs on the mux module's transmitter interface.
    - Configure one VC for 'ISBD-Tb, Mobile'.
    - Configure the second VC for 'ISDB-Tb, Fixed'.
3. Configure both encoders for ISDB-Tb allocating only the bandwidth allowed for each hierarchy.
4. Cross connect the encoders to the Mux VCs.
    - Create a Cross Connection linking the 'Mobile' encoder to the 'Mobile' Mux VC.
    - Create a Cross Connection linking the 'Fixed' encoder to the 'Fixed' Mux VC.

Procedure

Enable the Encoders and the TMX

1. Enable the TMX-M12 and encoder modules that will be used for this application.
    - Click on the 'Modules' branch of the navigation tree.
    - In the grid on right-hand side of the screen double-click on the column representing the TMX-M12 module. The 'Module Properties' dialog opens.
    - In the 'Slot #, Module Properties' dialog, set the 'Enable for Operation' checkbox.
    - Still in this same dialog, click on the slot in the 'Categories' list representing one of the two encoders required to support ISDB-Tb.
    - Set the 'Enable for Operation' checkbox.
    - Repeat the step above for the second encoder and press the 'OK' button to dismiss the 'Module Properties' dialog.

TS Transmitter Properties: Interface Dialog

Configure the following settings on the TMX-M12 module.

2. Expand the 'TS Transmitters' branch of the navigation tree.
3. Right-click on the desired transmitter and select 'Properties' from the floating dialog box.

4 In the 'TS Transmitter Properties: Interface' dialog...
- Set the 'Mode' to 'Tx-Only'
- Uncheck 'Enable Pass Through'.
- Set the 'Standard' to 'ASI, ISDB-Tb'.

Note: The 'Standard' setting above configures the mux's interface 'Rate (Mbps)' to '32.507937*'. However due to overhead, the actual payload rate is less than this value. The 'ISDB-Tb Modulation' page (referenced later in this procedure) provides the actual payload rates for each hierarchy.

5 Expand the interface sub-navigation tree within the 'TS Transmitter Properties' dialog.

TS Transmitter Properties: Transport Stream Dialog

6 Click on the 'Transport Stream' sub-menu branch to open the 'TS Transmitter Properties: Transport Stream' dialog and set the 'SI-PSI Mode' to 'ISDB-Tb'

TS Transmitter Properties: ISDB-Tb Modulation Dialog

7 Click on the 'ISBD, Modulation' sub-menu branch to open the 'TS Transmitter Properties: ISBD, Modulation' dialog...
- Set the 'Transmission Mode'.
- Specify the 'Carrier Frequency'.
- Select the 'Guard Interval'.
- If desired, check the 'Enable Partial Reception' checkbox. See the "Partial Reception VC" control on page 340 for details.
- Use the 'Hierarchy Segments' slider on this page to adjust the ratio between segments allocated to each of the two hierarchies.

8 Note the 'Capacity (Mbps) A, B' values.
- The left-side 'A' indicates the bandwidth available for hierarchy A.
- The right-side 'B' indicates the bandwidth available for hierarchy B.

Note: (1) Hierarchy A carries the mobile signal and is typically the most robust in terms of error correction. Hierarchy B carries the fixed signal and is less robust. If only one hierarchy is used, then use hierarchy A.
(2) Each setting on this page affect the amount of payload that a given Mux VC can carry. Note these values as they will be needed later to configure the associated encoders.

TS Transmitter Properties: ISDB-Tb Hierarchies Dialog

9 Click on the 'ISBD, Hierarchies' sub-menu branch to open the 'TS Transmitter Properties: ISBD, Hierarchies' dialog...
- Use the controls in the top half of this screen to configure settings for 'Hierarchy A'.
- Use the controls in the bottom half of this screen to configure settings for 'Hierarchy B'.

TS Transmitter Properties: ISDB-Tb Localization Dialog

10 Click on the 'ISBD, Localization' sub-menu branch to open the 'TS Transmitter Properties: ISBD, Localization' dialog...
- Select the 'Country Code' option in the drop down.
- Specify the 'Region'.
- Specify the 'Remote Control Key'. This field specifies the channel number that consumers will tune to on their set-top box to receive this signal.

11 Specify the values composing the 'Area Code'.
- Select the 'State' value.
- Select the 'Micro-Region' value.

12 Enter the 'Generating Station' value... OR the 'Network ID' and 'Transport Stream ID'. Typically, the 'Transport Stream ID' and the 'Network ID' to the same value.

TS Transmitter Properties: ISDB-Tb Time

13 Set the values in this dialog for the local time in the location where the transport stream will be received. See Section 11.6.13, "Config > TS Transmitter > Interface > ISDB, Time Dialog" on page 336 for details.

TS Transmitter Properties: VC Control Dialog

14 Click on the 'VC Control' sub-menu branch to open the 'TS Transmitter Properties: VC Control' dialog...

15 Click the 'New' button twice to create two new VCs on this Transmitter.

16 Configure one of the VCs to operate as the 'Mobile' VC and the other as the 'Fixed' VC.

- Specify a 'Tag' for each VC that will help distinguish its purpose from the other (ex; Mobile, Fixed).
- Specify the 'Program Number' for each VC.

TS Transmitter Properties: Program, ISDB-Tb Dialog

17 Click on the 'Program, ISDB-Tb' sub-menu branch to open the 'TS Transmitter Properties: Program, ISDB-Tb'.

18 Click on the 'Mobile' VC in the 'entries' list.

- Choose 'A' as the 'Hierarchy' for this VC.
- Set the 'Service Number' for this VC

19 Click on the 'Fixed' VC in the 'entries' list.

- Choose 'B' as the 'Hierarchy' for this VC.
- On the 'Partial Reception VC', select the 'Mobile VC'. See the "Partial Reception VC" control on page 340 for details.
- Set the 'Service Number' for this VC to '0'.

20 Click the 'OK' button to dismiss the 'TS Transmitter Properties' dialog.

Fixed-Service Encoder Settings

21 Expand the 'Encoders' branch of the navigation tree.

22 Right-click on the ENC-A21 encoder in the Navigation Tree and select 'Properties' to open the 'Encoder Properties' dialog.

23 Click on the 'Program' sub-menu branch to open the 'Encoder Properties: Program' dialog...

- Fill in the 'MPEG Name' with the consumer-facing channel-name for this program.
- Set the 'SI/PSI Mode' drop down to 'ISDB-Tb, Fixed' for fixed terrestrial receivers such as set-top boxes.
- Set the 'Network ID' to the same value used in Step 12 for the mux's 'Transport Stream ID' and the 'Network ID'.
- Set the 'TS Rate' for this program to the value in allocated for Hierarchy A in Step 8 above.

24 Click 'OK' to dismiss the 'Encoder Properties' dialog for this module.

Mobile-Service Encoder Settings

25 Right-click on the ENC-A11 encoder in the Navigation Tree and select 'Properties' to open the 'Encoder Properties' dialog.

- Fill in the 'MPEG Name' with the consumer-facing channel-name for this program.
- Set the 'SI/PSI Mode' drop down to 'ISDB-Tb, Mobile' for hand-held mobile receivers.
- Set the 'Network ID' to the same value used in Step 12 for the mux's 'Transport Stream ID' and the 'Network ID'.
- Set the 'TS Rate' for this program to the value in allocated for Hierarchy A in Step 8 above.

26 Click 'OK' to dismiss the 'Encoder Properties' dialog for this module.

Cross Connections

27 In the navigation tree, click and hold the ENC-A11 icon and drag it to the 'Mobile' Mux VC.

28 In the navigation tree, click and hold the ENC-A21 icon and drag it to the 'Fixed' Mux VC.

Write Settings

29 In Vidiem's menu bar, click 'Device > Write' to write these settings to the system.

Related Topics

"How to Add Entries to the ISDB-Tb Event Table" on page 131
"Config > Encoder > Events Dialog" on page 282
"Config > TS Transmitter > Interface > Transport Stream Dialog" on page 328
"Config > TS Transmitter > Interface > ISDB-Tb Modulation Dialog" on page 334
"Config > TS Transmitter > Interface > ISDB-Tb Hierarchies Dialog" on page 334
"Config > TS Transmitter > Interface > ISDB-Tb Localization Dialog" on page 335
"Config > TS Multiplexers > VC Control Dialog" on page 363

3.12.2 How to Add Entries to the ISDB-Tb Event Table

Abstract: *Use this procedure to manually add events to the event table.*

1. Expand the 'encoders' branch of the navigation tree.
2. Double-click on the desired encoder to open the 'Encoder Properties' dialog.
3. Click on the 'Events' branch in the sub-navigation tree.
4. Press the 'New' button to create a
5. Fill in the following fields in the 'Events dialog.
    - UTC Start 'Date' and 'Time'
    - The event 'Name' and 'Description'
6. Click the 'OK' button to dismiss the 'Encoder Properties' dialog.
7. In Vidiem's menu bar, click 'Device > Write' to write these settings to the system.

"How to Configure the TMX to Support ISDB-Tb" on page 128
"Config > Encoder > Events Dialog" on page 282
"Config > TS Transmitter > Interface > Transport Stream Dialog" on page 328
"Config > TS Transmitter > Interface > ISDB-Tb Modulation Dialog" on page 334
"Config > TS Transmitter > Interface > ISDB-Tb Hierarchies Dialog" on page 334
"Config > TS Transmitter > Interface > ISDB-Tb Localization Dialog" on page 335
"Config > TS Multiplexers > VC Control Dialog" on page 363

3.13 TMX: Mobile/Handheld (M/H) Procedures

3.13.1 How to Configure Mobile/Handheld (M/H) on an ATSC Broadcast Configuration

Abstract: *This procedure describes how to add an M/H configuration to an existing ATSC Broadcast Configuration.*

Prerequisites

This procedure assumes the system is hosting an existing, operational ATSC configuration.

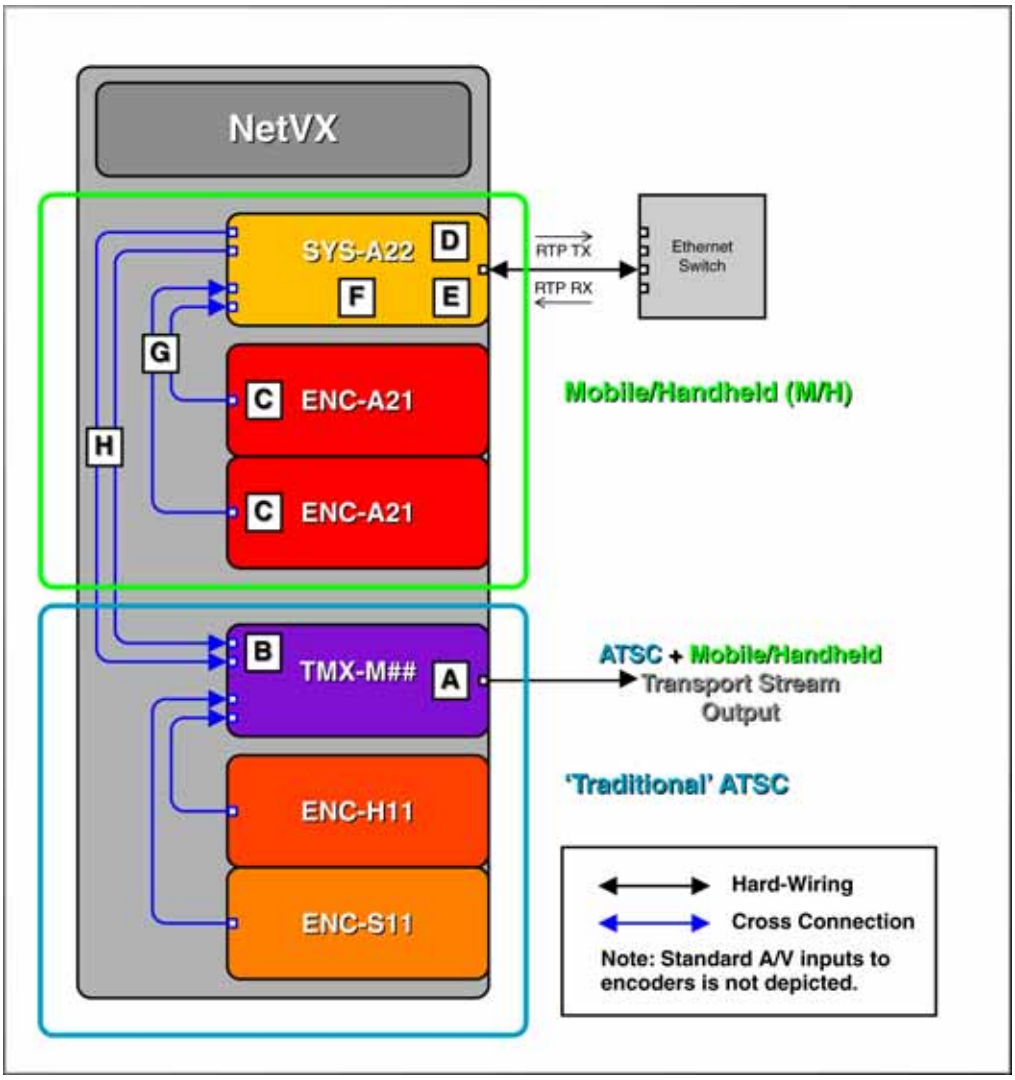


Figure 3-19 ATSC+M/H Configuration

A. M/H MUX Interface Configuration

1. Expand the 'TS Transmitters' branch of the navigation tree.
2. Right-click on 'TS transmitter Interface 1' and select 'Properties' to open the 'TS Transmitter Properties Dialog.'
3. Click on the interface name at the top of the sub-navigation tree. In the 'Interface' dialog...
   - Set the 'Mode' to 'Tx Only".
   - Set the 'Standard' to either 'ASI, M/H' or 'SMPTE-M/H'
4. Right-click on 'TS transmitter Interface 1' and select 'Properties' to open the 'TS Transmitter Properties Dialog.'

5 Click on the interface name at the top of the sub-navigation tree. In the 'Interface' dialog...
- Set the 'Mode' to 'Link-1".
- Set the 'Standard' to either 'ASI, M/H' or 'SMPTE-M/H'

B. M/H MUX VC Configuration

An M/H broadcast has one or more 'Parades' each of which contains a 'Primary Ensemble' and an optional 'Secondary Ensemble.'
For each 'Ensemble,' create one new VC:

6 Double-click the 'VC Control' branch in the sub-navigation tree to open the 'VC Control' dialog.
- Click the 'New' button to create a new VC.
- Change the VC's 'Function' to 'M/H'.

7 Click the 'Program M/H' branch of the sub-navigation tree.
- Set each of the values on this page according to both your application's specifications and those of the modulator vendor. Press F1 for short descriptions of each of these fields or see Section 11.7.3, "Config > TS Transmitter > VC Control > M/H Ensemble Dialog" on page 341 for descriptions.
- Note the 'Parade ID' specified for each VC created. This value is use d in a later step.
- Configure at least one 'Ensemble' as 'Primary.' If the 'Ensemble' is set to 'Secondary', then a 'Primary' ensemble with the same 'Parade ID' must exist as well.

Note: After configuring each of the values in the 'M/H Program' dialog, note the 'Total Avail. ATSC Rate' in the box at the bottom-right. This value represents the maximum bandwidth available to ATSC programs on this interface. Take care to ensure that the collective bandwidth usage by all ATSC programs does not exceed this value.

---

8 Click 'OK' to dismiss this dialog, and choose 'Device > Write' from Vidiem's menu-bar to write these settings to the system.

C. Encoder Configuration

For each encoder contributing a program to the ATSC+M/H multiplex...

9 Expand the 'Encoders' branch and double-click on the encoder you plan to use to create the M/H stream. In the 'Program' dialog...

9a Set the 'TS Rate' to the desired rate for this program.

9b Set the 'SI/PSI Mode' to 'ATSC M/H.' This setting affects the following.
- The video 'Input Source' is set to 'SDI-525.'
- The video 'Resolution' is set to 'MPH 416.'
- The audio 'Standard' is set to 'HE-AAC.'

10 Click 'OK' to dismiss this dialog, and choose 'Device > Write' from Vidiem's menu-bar to write these settings to the system.

D. SYS-A22 Module: RTP TX VC Configuration

Note: The steps in this sub-section are not necessary if an external signaling table generator is being used in the M/H configuration. In that case the system providing the stream takes care of this function.

---

11 Click the 'VC Control' branch in the sub-navigation tree.

12 Click the 'New' button to create a new IP VC. In the 'VC Control' dialog...
- Set the function to 'M/H RTP TX.'

13 Expand 'VC Control' and click on the 'MPEG Tx, Network' branch in the sub-navigation tree.
- Specify the 'Group Address' that the multicast shall be transmitted on.

E. SYS-A22 Module: RTP RX VC Configuration

The RTP RX VC multiplexes M/H services (programs) into one ensemble. Therefore each ensemble requires an RTP RX VC.

14 Right-click on the SYS-A22 and choose 'Properties' to open the 'IP Properties' dialog.

15 Click the 'VC Control' branch in the sub-navigation tree.

16 Click the 'New' button to create a new IP VC.
- Set the function to 'M/H RTP RX.'

17 Click the 'VC Control, Network' branch. In the 'Network' dialog...
- Set the 'RX Policing Rate' to the total rate available for the MH VC.
- Set the 'Ensemble ID' to the desired value.

(Optional) RTP RX VC Configuration Steps

Note: The following steps are necessary only if an external signaling table generator is being used in the M/H configuration.

18 (Optional) Click the 'VC Control, MPEG Rx' branch. In the 'MPEG Rx' dialog...
- Check 'External M/H signalling' for 'UDP'.

19 (Optional) Click the 'VC Control, MPEG Rx, Multicast' branch. In the 'MPEG Rx, Multicast' dialog...
- Specify the IP Address of the external Signalling Table Generator.
- Specify the multicast 'Group Address'.

Note: The multi-cast IP address must be between 224.###.###.### and 239.###.###.###.

20 Click 'OK' to dismiss this dialog, and choose 'Device > Write' from Vidiem's menu-bar to write these settings to the system.

F. Define M/H Services

Define services for each ensemble.

21 Expand the 'IP Modules' branch of the Navigation tree.

22 Right-click on the SYS-A22 and choose 'Properties' to open the 'IP Properties' dialog.

23 Click on the 'M/H Services' branch in the sub-navigation tree of the 'IP Properties' dialog (still on the SYS-A22).

24 Click on the first '-- unused --' entry in the list and click the 'New' button.
- Specify a 'Name' for this M/H service. The 'Name' specified is the string that will appear on mobile handsets.
- Choose the 'Ensemble Id' (specified in Step 17) from the drop down list.
- Specify the 'Major' and 'Minor' channel numbers for this service.
- Specify the 'Low Destination Port' for this service. Use this control to specify the starting (IP multicast) port number for contiguous series of services that shall make up this ensemble.
- Specify the 'Port Count.' Use this control to specify how many IP multicast ports shall be used. Ports start with the 'Low Destination Port' value specified above, and increase +1 until the port count (inclusive of the first port) is reached. The ENC-A21 uses four ports: 1 for video, 1 for video control, 1 for audio, 1 for audio control.
- Specify the multicast 'Group Address' specified in Step 13. Use this control to specify the IP multicast address on which this ensemble is located.

25 Click 'OK' to dismiss this dialog, and choose 'Device > Write' from Vidiem's menu-bar to write these settings to the system.

Note: If the source is not from an 'internal' encoder (an encoder located on the NetVX) then the 'language code' may be ignored.

26 Click 'OK' to dismiss this dialog, and choose 'Device > Write' from Vidiem's menu-bar to write these settings to the system.

G & H. Create Cross Connections

Create cross connections linking the elements created above.

Note: Please refer to Figure 3-19, "ATSC+M/H Configuration" on page 132 for details.

27 G. Cross connect the encoders to the SYS-A22's RX VCs.
- Ref: Encoders configured in section C. Encoder Configuration.
- Ref: RX VCs created in D. SYS-A22 Module: RTP TX VC Configuration.

28 H. Cross connect the SYS-A22 TX VCs to the TMX-M12's MUX VCs.

- Ref: TX VCs created in D. SYS-A22 Module: RTP TX VC Configuration).
- Ref: MUX VCs created in B. M/H MUX VC Configuration

29 Choose 'Device > Write' from Vidiem's menu-bar to write these settings to the system.

Related Topics

- Section 11.7.3, "Config > TS Transmitter > VC Control > M/H Ensemble Dialog" on page 341
- Section 13.2.7, "Config > IP Modules > M/H Services Tab" on page 404
- Section 13.3.3, "Config > IP Modules > M/H Services" on page 408

3.14 VC: Virtual Channel Procedures

3.14.1 How to Create an ATM Virtual Channel

Abstract: *Use this procedure to create a VC on a NetVX's ATM module.*

1. Select 'Modules > ATM Interfaces' in the configuration tree.
2. Locate the ATM module on which you want to create a Virtual Channel (VC).
3. Double-click the desired ATM interface to open the 'ATM Properties' dialog.
   - Entries such as '#.1' represent the SONET/SDH optical interface.
   - Entries such as '#.2' represent the PDH electrical interface.
4. Click on 'VC Control' in the configuration tree.
5. Press the 'New' button to create a new virtual channel.
6. (Optional) Enter a tag to label this VC. The tag may be up to 31 characters in length.
7. Select the desired VC function.
   - Select the function 'IP over ATM' for ATM VCs that shall connect to IP VCs.
   - Select the function 'MPEG on AAL-1' or 'MPEG on AAL-5' for ATM VCs supporting cross connections to encoders, or a decoders. Use this option when the cross connection the VC supports begins or terminates a signal.
   - Select the function 'ATM' for ATM VCs supporting cross connections to other ATM VCs and used to bridge connections between NetVX systems. The VCs supporting cross connections E and F in on NetVX 2 in "IPOA Ring Network Worksheet" on page 89 are configured in this way.
   - Select the function 'ATM-VP' to cause this VC to accept only traffic that shares the same VPI. See "How to Route ATM Traffic According to VPI" on page 145 for a full procedure.
   - Enter the VPI and VCI for this new VC.
8. Double-click 'VC Control' to expand the configuration tree.
9. Click on the 'VC Processing' branch to open the 'VC Processing Dialog'.
   - Select the desired 'Transmit Priority'. Vidiem™ selects a reasonable default for this setting based on the selected VC function.
   - For IPOA VCs only:
     - Use the 'Logical IP Subnet' drop-down to assign this VC to a LIS.
   - For MPEG on AAL-1 or AAL-5 VCs only:
     - Choose the type of MPEG 'Processing'.
     - AAL-5 only: Choose an 'AAL PDU Size'.
10. Click on 'VC Rates' in the configuration tree.
11. Set the I/O rates for this VC.
    - Set the 'ATM Rx Rate' to the maximum rate of input for this VC. Data are dropped if the rate of incoming data exceeds the value specified here.
    - Set the 'Payload Tx Rate' for the rate of data entering this VC.

Note: For example, the VC payload rate should be 6 Mbps for an encoder producing a 6 Mbps transport stream cross-connected to this ATM VC.

12. Select 'Device > Write…' to write these changes to the system.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.

Virtual Channel-Related Procedures

- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create a 'Copy' ATM Virtual Channel" on page 138
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Delete a Virtual Channel" on page 144.
- "How to Route ATM Traffic According to VPI" on page 145.

3.14.2 How to Create a 'Copy' ATM Virtual Channel

Abstract: *This feature lets one VC (the base) share its data stream with another VC (the copy).*

The 'copy VC' facility designates a local channel that lets the system extract the MPEG-2 stream for local decoding (or other processing) without disturbing the original ATM traffic. A typical application for this feature is when a video source is encoded on one NetVX. The resulting MPEG stream is transported through one or more NetVXs over an ATM network. All intermediate NetVXs must pass the ATM traffic to the next node, but any or all may also want to decode the stream. To properly deal with MPEG-2 and ATM timing issues, intermediate nodes need to treat the forwarded stream as ATM traffic. Simultaneously, they need to extract the MPEG-2 stream from the ATM VC to allow local decoding.

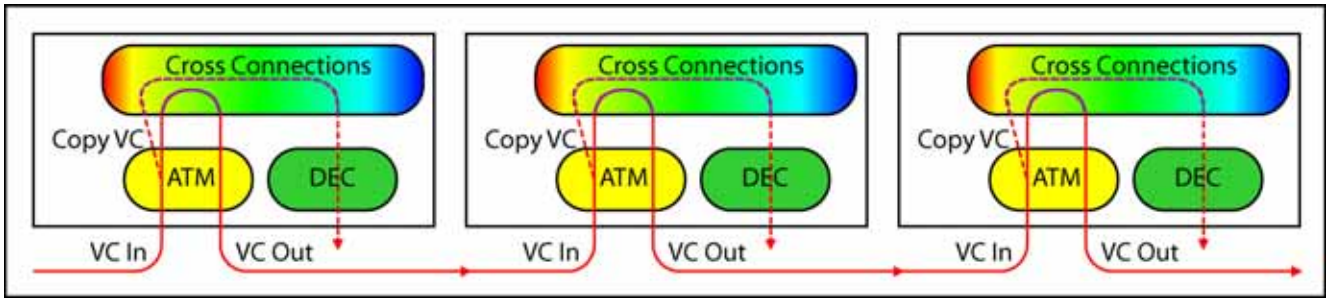


Figure 3-20 Example of the Relationship between a Source and a Copy VC

Use this procedure to create a duplicate of an MPEG-2 stream from an incoming ATM virtual channel.The program stream resulting from these steps may be used for decoding or routing elsewhere via cross connections.

Prerequisites

- The ATM module must be configured with at least one VC.
- The VC must be from an external source.
- The VC must carrying an MPEG-2 transport stream.

Procedure

1. In the configuration tree, select the ATM interface with incoming VC that you want to duplicate.
2. Right-click and choose 'Properties'.
3. In the 'ATM Properties' configuration tree click on 'VC Control'.
4. Press the 'New' button to create a new VC.
    - (Optional) Enter a useful tag for this new VC entry.
    - Select either 'MPEG on AAL1' or 'MPEG on AAL5' as the function.
    - Select the 'Copy From VC' option.
    - Select the VC to copy from the drop down list. The list provides only valid, available choices.
    - Expand the 'VC Control' branch in the configuration tree and select the 'VC Processing' branch.
    - Choose the desired 'Processing' and 'Function' from the available choices.
5. Press the 'OK' button to complete the creation of this Copy VC.
6. Select 'Device > Write…' to write these changes to the system.

General Guidelines for Creating Copy VCs

- A base VC can have only one copy.
- A base VC's 'Function' parameter must be set to 'ATM' - indicating general ATM traffic
- A copy VC's may only serve as a *source* of a cross connection.
- A copy VC's 'Payload Tx Rate' rate should be set to zero, indicating it transmits no traffic to the network.

Note: Contact technical support if you find you need to use more than eight (8) copy VCs and the sum of the total rate of these VCs exceeds 100 Mbps.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.

Virtual Channel-Related Procedures

- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Delete a Virtual Channel" on page 144.
- "How to Route ATM Traffic According to VPI" on page 145.

3.14.3 How to Create an IP Virtual Channel

The following procedures provided detailed instructions for configuring a few common types of IP VCs. Small variations on these procedures provide a means to configure VCs for other operations.

- "How to Configure an IP VC for VLAN Support" on page 140.
- "How Configure an IP VC to Receive a Source-Specific Multicast" on page 141.
- "How to Configure an IP VC to Transmit a Source-Specific Multicast" on page 142.

3.14.4 How to Configure an IP VC for VLAN Support

Abstract: *Use this procedure when configuring the NetVX's IP VCs for use with VLAN-aware switches.*

1. Open the 'IP Properties' dialog.
   - In the configuration tree, select 'Modules > IP Modules'
   - Right-click on the desired 'GBE-C11' module and select 'Properties'.
2. At the bottom of the 'GBE-C11' dialog, select either one of the following for the 'Mode' drop down.
   - Trunk, Minimal Routing
   - Trunk, Full Routing
3. Highlight 'VC Control' in the 'IP Properties' dialog.
   - In the 'Entries' list, highlight the VC that you want to configure.
   - Set the VC's 'Function' to 'LAN'.
4. Click on 'Network' in the sub-navigation tree to open the 'Network' dialog.
   - Specify the 'VLAN ID' for this VC.
   - Specify the 'Policing Rate' for this VC **.
5. Repeat the above steps for any other VCs as desired.
6. Press the 'OK' button.
7. Select 'Device > Write…' to write these changes to the system.

Note: ** The 'Policing Rate' specifies the maximum rate at which data shall flow through this VC. Data exceeding this rate are dropped. If this VC is connecting to an ATM VC for LAN extension, then care must be taken to ensure that: (1) This VC's 'Policing Rate' does not over-run the maximum possible rate available to the ATM VC and, (2) This VC's 'Policing Rate' matches the ATM VC's 'Payload Rate'.

Related Topics

- "GBE & SYS: LAN Extension and VLAN Procedures" on page 152.
- "How to Manually Configure the IP Routing Table" on page 150.

3.14.5 How Configure an IP VC to Receive a Source-Specific Multicast

Abstract: *Use this procedure to configure an IP VC to receive a source-specific multicast. The GBE supports Internet Group Management Protocols (IGMP) version 1 (RFC 1112), version 2 (RFC 2236), and version 3 (RFC 3376).*

1. Open the 'IP Properties' dialog.
   - In the configuration tree, expand the 'Modules' branch and then expand the 'IP Modules' branch.
   - Right-click on the desired 'GBE-C11' module and select 'Properties'.
2. In the 'IP Properties' dialog, set the following items (if they are not already set).
   - Set the 'IP Address'.
   - Set the 'IP Subnet Mask'.
3. Double-click 'VC Control' branch in the sub-menu tree to expand the underlying branches.
4. Click the 'New' button in the 'VC Control' page.
5. Choose the 'MPEG RTP Rx' function.
6. Click on the 'MPEG Rx' branch and specify the following.
   - The 'UDP Port' on which the stream is located.
   - The type of 'MPEG Processing'.
   - The multicast 'Group Address'.
   - * The IP 'Source Address'.

Note: * If another NetVX is the source the multicast, then the IP 'Source Address' should be the IP address of the GBE interface that is providing the stream.

7. Press the 'OK' button.
8. Select 'Device > Write…' to write these changes to the system.

Related Topics

- "How to Configure an IP VC to Transmit a Source-Specific Multicast" on page 142

3.14.6 How to Configure an IP VC to Transmit a Source-Specific Multicast

Abstract: *Use this procedure to configure an IP VC to transmit a source-specific multicast. The GBE supports Internet Group Management Protocols (IGMP) version 1 (RFC 1112), version 2 (RFC 2236), and version 3 (RFC 3376).*

1. Open the 'IP Properties' dialog.
   - In the configuration tree, expand the 'Modules' branch and then expand the 'IP Modules' branch.
   - Right-click on the desired 'GBE-C11' module and select 'Properties'.
2. In the 'IP Properties' dialog, set the following items (if they are not already set).
   - Set the 'IP Address'.
   - Set the 'IP Subnet Mask'.
3. Double-click 'VC Control' branch in the sub-menu tree to expand the underlying branches.
4. Click the 'New' button in the 'VC Control' page.
5. Choose the 'MPEG RTP Tx' function.
6. Click on the 'MPEG Tx, Network' branch and specify the following items.
   - The 'IP Address'. This IP address must be a multicast 'Group Address'.
   - The 'UDP Port' to associate with this multicast.
   - The 'Payload Tx Rate'.
   - The 'Type of Service'.
   - * The IP 'Source Address'.
7. Click on the 'MPEG Tx, Stream' branch and specify the following items.
   - The 'MPEG Processing'.
   - The amount of transport packets that should inserted into each IP packet 'TS Packets/IP'.
   - The level of 'Forward Error Correction' that should be used with this stream.
8. Press the 'OK' button.
9. Select 'Device > Write…' to write these changes to the system.

Related Topics

- "How Configure an IP VC to Receive a Source-Specific Multicast" on page 141.

3.14.7 How to Modify a Virtual Channel

Abstract: *Use this procedure to modify any kind of VC.*

1. Navigate to the VC that you want to modify.
   - ATM VCs…
     Select 'Modules > ATM Interfaces' and expand the branch of the ATM interface hosting the VC that you want to modify.
   - IP VCs…
     Select 'Modules > IP Modules' and expand the branch of the module hosting the VC that you want to modify.
   - Mux and Demux VCs…
     Select either 'Modules > TS Receivers' or 'Modules > TS Transmitters' and expand the branch of the TMX-M12 interface hosting the VC that you want to modify.
2. In the configuration tree, double click the VC to modify.
3. Modify any of the VC's configuration parameters as desired.
4. Press the 'OK' button to complete modifications to this VC.
5. Select 'Device > Write…' to write these changes to the system.

Cross-Connection Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.

Virtual Channel-Related Procedures

- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create a 'Copy' ATM Virtual Channel" on page 138
- "How to Create an IP Virtual Channel" on page 139.
- "How to Delete a Virtual Channel" on page 144.
- "How to Route ATM Traffic According to VPI" on page 145.

3.14.8 How to Delete a Virtual Channel

Abstract: *Use this procedure to delete any type of VC.*

1. Navigate to the VC that you want to delete…
   - ATM VCs…
     Select 'Modules > ATM Interfaces' and expand the branch of the ATM interface hosting the VC that you want to delete.
   - IP VCs…
     Select 'Modules > IP Modules' and expand the branch of the SYS-G10 module hosting the VC that you want to delete.
   - Mux and Demux VCs…
     Select either 'Modules > TS Receivers' or 'Modules > TS Transmitters' and expand the branch of the TMX-M12 interface hosting the VC that you want to delete.
2. In the configuration tree, highlight the VC that you want to delete.
3. Press the delete button or right-click and select 'Delete' from the pop-up menu.
4. Select 'Yes' when prompted to complete deletion of the VC.
5. Select 'Device > Write…' to write these changes to the system.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.

Virtual Channel-Related Procedures

- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create a 'Copy' ATM Virtual Channel" on page 138
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Route ATM Traffic According to VPI" on page 145.

3.14.9 How to Route ATM Traffic According to VPI

Abstract: *Use this procedure to configure an ATM VC to accept only ATM traffic that shares its VPI.*

1. Select 'Modules > ATM Interfaces' and expand the branch of the ATM interface hosting the VC that you want to modify.
2. Create a new ATM VC, if necessary.Otherwise skip to the next step. See "How to Create an ATM Virtual Channel" on page 136 for details.
3. Right-click on an existing VC in the tree and select 'Properties' to open the 'ATM Properties' dialog.
4. In the 'ATM Properties' dialog, click in the 'VC Control' branch
5. Set the VC's 'Function' to 'ATM-VP'.
6. Configure the VC's VPI parameter as desired.
7. Click 'OK'.
8. Press the 'OK' button to complete modifications to this VC.
9. Select 'Device > Write…' to write these changes to the system.

Upon completion of these steps, the selected VC will accept only that ATM traffic which shares the same VPI value as was configured in step 6 above.

On each ATM interface, each VC configured with function 'ATM-VP' must be configured with a unique VPI; otherwise an "VC Degrade - Configuration Error" on page 506 is raised.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.

Virtual Channel-Related Procedures

- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create a 'Copy' ATM Virtual Channel" on page 138
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Delete a Virtual Channel" on page 144.

3.15 Cross Connection Procedures

3.15.1 How to Create a Cross Connection

Abstract: *This topic describes how to create various types of cross connections for linking encoders, decoders, and virtual channels.*

1. Prepare the source and destination that you plan to connect.
   - A source may be either a VC or an encoding module. The NetVX supports several different types of VCs. Minimally you must create a VC and specify its 'Function'. Settings for VCs and encoders can be changed later, after the cross connection is created.
   - A destination may be a VC or a decoding module.
2. Expand branches in the configuration tree as needed to reveal desired source and destination VCs or modules.
3. Select a source in the configuration tree.
4. Drag the source to the desired destination and drop.

Note: The wizard presents a dialog when it detects a conflict with other resources. Choices at that point are usually to create a new cross connection and delete the existing cross connection, create a backup cross connection, or to cease the attempt to create a cross connection.

5. Vidiem™ opens the Connection Wizard prompting you to name the cross connection.
6. In the wizard, enter a tag to name this cross connect.
7. Click the 'Finish' button to close the wizard.
8. Select 'Device > Write…' to write these changes to the system.

Note: Up to eight cross connections can be created from each source.

Related Topics

Please read these overview topics before proceeding as they provide important background information.

- "Overview of NetVX Interfaces and Addressing" on page 179.
- "Overview of Virtual Channels" on page 183.
- "Cross Connection Procedures" on page 146.
- "Overview of Navigation Tree Icons" on page 180.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.
- "How to Create an ATM Virtual Channel" on page 136.

Virtual Channel-Related Procedures

- "How to Create a 'Copy' ATM Virtual Channel" on page 138
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Delete a Virtual Channel" on page 144.
- "How to Route ATM Traffic According to VPI" on page 145.

3.15.2 How to Configure a Backup Cross Connection

Abstract: *User this procedure to create a backup cross connection.*

1. Create a cross connection, as normal, by linking (dragging and dropping) a source and a destination in the navigation tree. See "How to Create a Cross Connection" on page 146 for details.
2. Create a backup cross connection by linking (dragging and dropping) a different source to the same destination. The 'Cross Connection Wizard' will prompt you to choose whether the backup connection should have a 'Primary', 'Backup', or 'Revertive' role.
3. Ensure that all modules related to this procedure are enabled.
    - Select 'Modules' in the configuration tree.
    - Scan the row labelled 'State' to see the state of each module.
    - Double-click on any cell in this row of the table to open the 'Modules' dialog.
    - Check the 'Enable for Operation' checkbox to configure the module to be enabled the next time changes are written to the system.
4. Select 'Device > Write…' to write these changes to the system.

Cross Connection-Related Procedures

- "Overview of Cross Connection Redundancy" on page 446
- "How to Create a Cross Connection" on page 146.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.

Virtual Channel-Related Procedures

- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create a 'Copy' ATM Virtual Channel" on page 138
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Delete a Virtual Channel" on page 144.
- "How to Route ATM Traffic According to VPI" on page 145.

3.15.3 How to Modify a Cross Connection

Abstract: *Use this procedure to modify a Cross Connection's 'Tag', or label.*

Note: Only the tag may be modified in an existing cross connection. A new cross connection is required to change either the source or the destination.

1. Select 'System > Cross Connections' and double-click on the cross connection you want to modify.
2. Edit the Tag field as desired.
3. Press 'OK'.
4. Select 'Device > Write…' to write these changes to the system.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Delete a Cross Connection" on page 149.

Virtual Channel-Related Procedures

- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create a 'Copy' ATM Virtual Channel" on page 138
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Delete a Virtual Channel" on page 144.
- "How to Route ATM Traffic According to VPI" on page 145.

3.15.4 How to Delete a Cross Connection

Abstract: *Use this procedure to delete a Cross Connection.*

1. Expand the 'System' branch in the configuration tree.
2. Click on 'Cross Connection
3. Right-click in the row representing the cross connection that you want to delete.
4. Select 'Delete' from the pop-up menu.
5. Choose 'Yes' when prompted.
6. Select 'Device > Write…' to write these changes to the system.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.

Virtual Channel-Related Procedures

- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create a 'Copy' ATM Virtual Channel" on page 138
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Delete a Virtual Channel" on page 144.
- "How to Route ATM Traffic According to VPI" on page 145.

3.16 GBE & SYS: IP Module Procedures

3.16.1 How to Manually Configure the IP Routing Table

Abstract: *Use this procedure to manually configure the NetVX's IP Routing table.*

Each NetVX's IP Routing Table identifies every IP address that is 'reachable' by the system. Some entries simply specify the next hop en route to a destination address, other specify the destination address itself.

1 Open the 'IP Routing Table' dialog.
- Select 'Modules > IP Modules > SYS-xxx
- Right-click on 'Properties' and select 'IP Routing Table'.

Note: SYS-xxx represents any system controller module: SYS-G10, SYS-A12, SYS-A22.

2 Configure each IP Routing Table Entry.
- In the 'IP Routing Table' dialog, highlight an entry.
- (Optional) Enter a tag identifying this entry. This approach can be helpful if you later need to identify entries associated with equipment that has been removed from the network.
- Enter the 'Destination IP Address'. This setting identifies the IP address of the device that you want to reach.
- Enter the 'Destination IP Subnet'. This setting identifies the subnet on which the device that you are trying to reach is located.
- Enter the 'Next Hop IP Address'. This setting indicates the next IP address in the network that is en route to the desired subnet and ultimately, the destination address. Use the IP Inverse ATM ARP Table as needed to identify ATM IP Addresses of remote systems. Go to: 'Status > (select the desired system in the status tree) > Modules > IP Modules > SYS-xxx > IP Inverse ATM ARP' tab). Read this "Overview of NetVX Inverse ATM ARP Functionality" on page 90 for details on Inverse ATM ARP.

Note: Repeat step 2, as needed, for every IP address with which this NetVX will communicate.

3 Press the 'OK' button to dismiss the 'IP Routing Table' dialog.

4 Select 'Device > Write…' to write these changes to the system.

Related Dialog

"Config > IP Modules > IP Routing Table Dialog" on page 407

3.16.2 How to Carry LAN Traffic over a Transport Stream Connection (IP on TS)

Abstract: *Use this procedure to configure the NetVX to carry LAN traffic over a point-to-point transport stream connection.*

1. Open the 'IP Properties' dialog.
   - In the configuration tree, select 'Modules > IP Modules'
   - Right-click on the desired 'GBE-C11' module and select 'Properties'.
2. In the 'GBE-C11' dialog, set the interface 'Mode' (under 'LAN Behavior') to either 'Trunk Minimal' or 'Trunk Full'.
3. Create a new IP VC.
   - Highlight 'VC Control' in the 'IP Properties' dialog's menu tree.
   - Click the 'New' button to create a new VC.
   - Configure the new VC's settings as needed and be sure to set the VC's 'Function' to 'LAN-TS'.
4. Press the 'OK' button.
5. Use the either of the following procedures to create passthrough connections in both directions on the TMX.
   - "How to Route an ASI or 310M Input to a Demux VC (Pass Through)" on page 91.
   - "How to Route an Internal Transport Stream to an ASI or 310M Output (Pass Through)" on page 95.
6. Create a Cross connection linking the IP VC created in step 3 with the mux VC created in step 5.
7. Select 'Device > Write…' to write these changes to the system.

3.17 GBE & SYS: LAN Extension and VLAN Procedures

Beginning with firmware release 5.6, the NetVX provides support for high-speed IP data routing over ATM. This feature extends a high-speed LAN, or several VLANs, across an ATM network.

The NetVX supports Virtual Local Area Network (VLAN) packet tagging as described in IEEE 802.1Q. A unique VLAN ID may be specified for each IP VC on a GBE-C11 module. Packets emanating from these VCs are tagged with VLAN IDs. VLAN-aware IP switches can then route packets, based on VLAN ID, to the desired LAN.

3.17.1 How to Configure VLAN and LAN Extension

Figure 3-21 demonstrates how implementing VLAN and LAN extension on a NetVX network can extend high-speed LAN communication between multiple, distinct LANs over ATM.

The VLAN feature on the GBE-C11 module on (NetVX) System 1 provides cost savings by interfacing with a VLAN-aware switch. The switch aggregates IP traffic from several LANs (A, B and C) into the system.

In the reverse direction, the switch distributes IP traffic based on VLAN ID. Therefore VLAN support on the GBE-C11 allows the switch to perform the packet routing that would otherwise require a separate GBE-C11 module for each LAN.

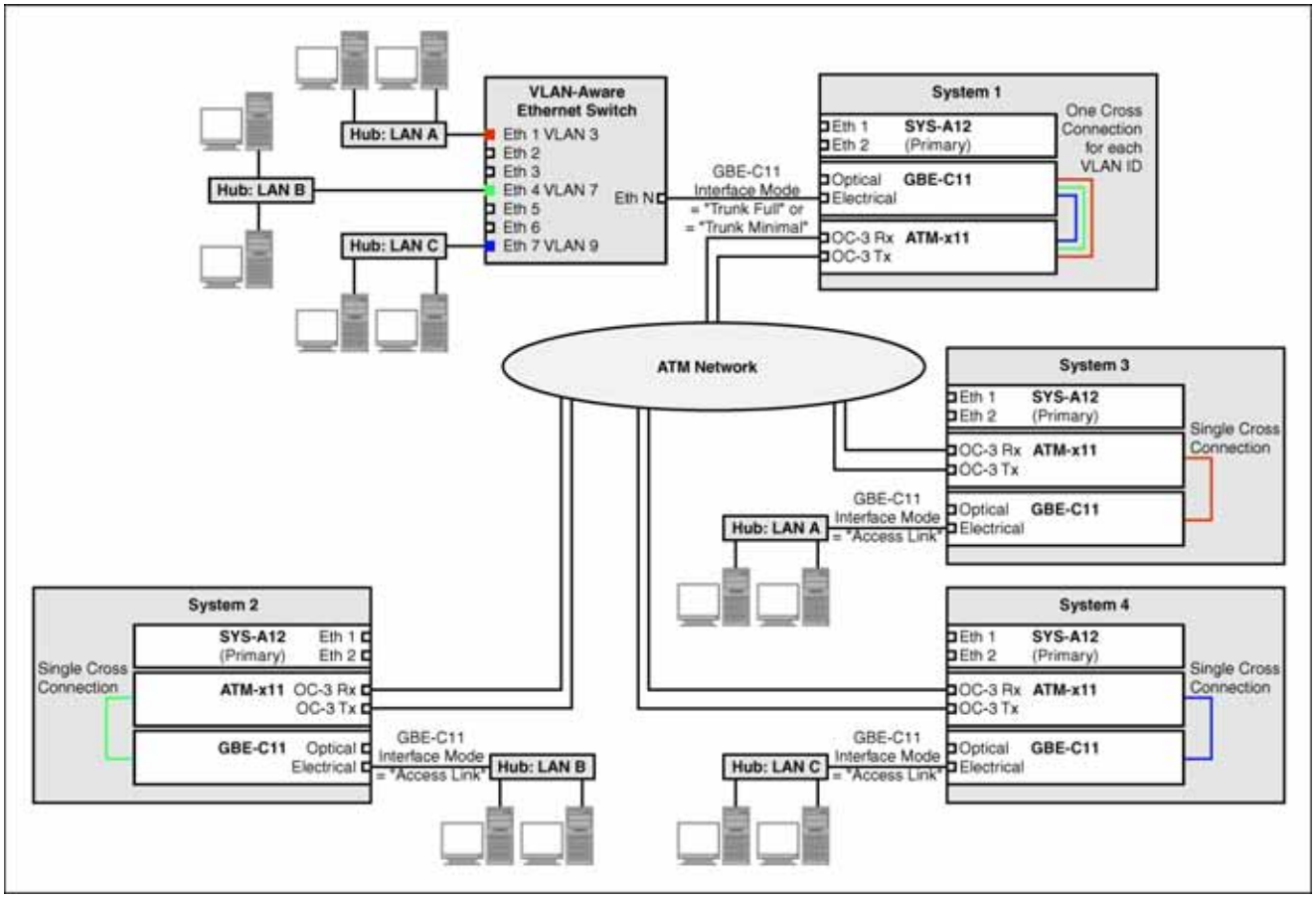


Figure 3-21 A NetVX Network Using VLAN and LAN Extension

The LAN extension feature on the GBE-C11 modules on NetVXs 2, 3 and 4 allows the GBE-C11 to port high-speed LAN traffic between the ATM interface and external equipment. In each of these examples, that equipment is a hub.

Note: The notes that follow highlight important configuration details of the network configuration shown in Figure 3-21.

System 1 Configuration

1. Configure System 1's GBE-C11's interface to operate in either 'Trunk, Full-Routing' or 'Trunk, Minimal-Routing' mode. Use 'Trunk, Full-Routing' only when control protocols such as Telnet or SNMP are desired for in-band control.

Note: In-band control is *not shown* in Figure 3-21.

2. Configure System 1's GBE-C11 module with an IP VC for each VLAN ID.
   - Assign each VC a (unique) VLAN ID. The VC carries only those tagged packets that match the specified ID.
   - Assign each VC the 'LAN' function.

Note: On GBE-C11 VCs, the 'Policing Rate' specifies the maximum rate at which data shall flow through the VC. Data exceeding this rate are dropped. If the VC is connecting to an ATM VC for LAN extension, then care must be taken to ensure that: (1) This VC's 'Policing Rate' does not over-run the maximum possible rate available to the ATM VC and, (2) This VC's 'Policing Rate' matches the ATM VC's 'Payload Rate'.

3. Configure System 1's ATM module with an IPOA VC corresponding to each IP VC on the GBE-C11 module. Assign these VCs the 'LAN' function as well.
4. Create Cross Connections linking the GBE-C11's VCs with the ATM module's VCs.

Systems 2, 3, and 4 Configuration

1. On each system's ATM module, create a single VC to allow the module to bidirectionally exchange LAN traffic with the GBE module. Assign the 'LAN' function to each of these VCs.
2. Configure each system's GBE-C11 module to operate in 'Access Link' mode. This mode requires (and allows) only a single IP VC to carry bidirectional LAN traffic.

Note: When the 'Access Link' mode is selected on the GBE-C11interface, Vidiem™ deletes any existing VCs and creates a single VC configured to carry LAN traffic.

Related Topics

- "How to Link VLANs Over ATM" on page 154
- "How to Configure an IP VC for VLAN Support" on page 140

3.17.2 How to Link VLANs Over ATM

Figure 3-22 demonstrates another network configuration using VLAN and LAN extension. In this example two NetVX systems, connected through an ATM network, each interface with a VLAN-aware switch to extend LANs A, B, and C across the ATM network.

This network configuration may be easily scaled to support additional NetVXs attached to the same ATM network.

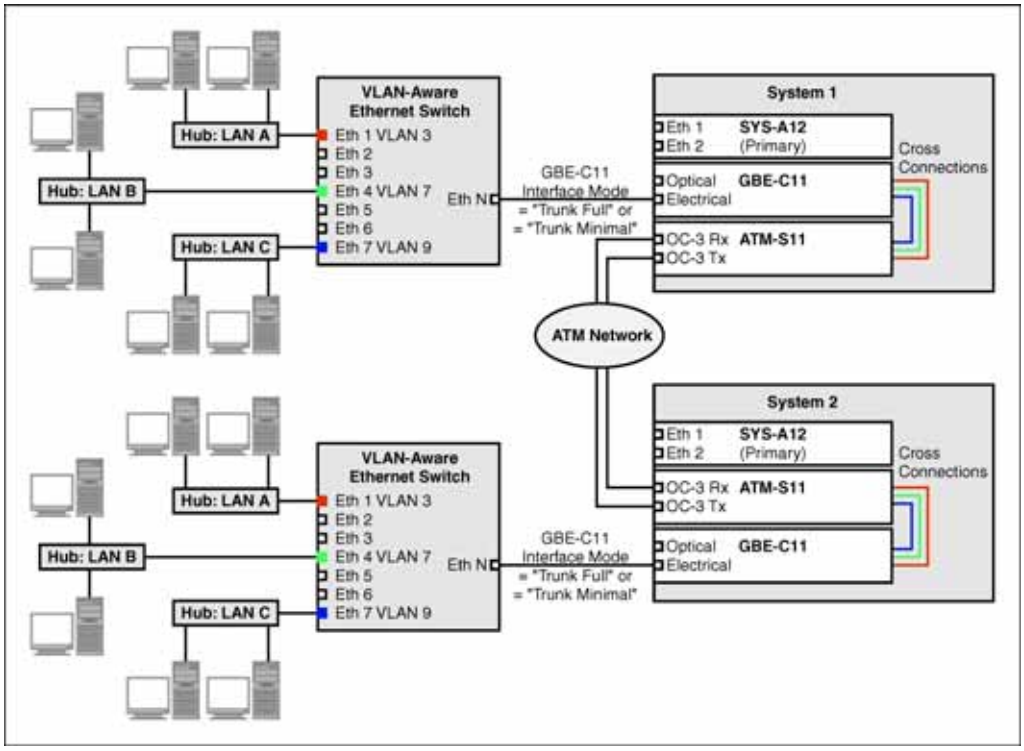


Figure 3-22 NetVX Network Linking Two VLANs Over ATM

1 Configure each system's GBE-C11's interface to operate in either 'Trunk, Full-Routing' or 'Trunk, Minimal-Routing' mode. Use 'Trunk, Full-Routing' only when control protocols such as Telnet or SNMP are desired for in-band control.

Note: In-band control is *not shown* in Figure 3-22.

2 Configure System 1's GBE-C11 module with an IP VC for each VLAN ID.
- Assign each VC a (unique) VLAN ID. The VC carries only those tagged packets that match the specified ID.
- Assign each VC the 'LAN' function.

3 Configure System 1's ATM module with an IPOA VC corresponding to each IP VC on the GBE-C11 module. Assign these VCs the 'LAN' function as well.

4 Create Cross Connections linking the GBE-C11 VCs with the ATM module VCs.

Related Topics

- "How to Configure VLAN and LAN Extension" on page 152
- "How to Configure an IP VC for VLAN Support" on page 140

3.18 NetVX System Configuration Procedures

3.18.1 Overview of NetVX System Configurations

NetVX's System Configurations are numbered 1- 99 and are stored internally by NetVX.

NetVX (and FlexiCoder DVS) configuration files are stored on a PC or local are network file system by the Vidiem™ Management System using the 'File > Save As' menu combination. The following table highlights the difference between these two types of configurations.

Table 3-6 Comparison of Internal and File-System Based Configurations

Type of Configuration	Internal System Configurations	Configuration Files
Location	Internal (on the NetVX)	PC or Network File System
Maximum Number of Configurations	Up to 99	Unlimited
Load/Save Using Vidiem™	●	●
Load/Save Using Front Panel	●	❍
Load/Save Using Telnet	●	❍
Load/Save Using Craft Port	●	❍

3.18.2 How to Save a NetVX System Configuration

1. Configure the system as desired.
2. Open the 'Configuration' dialog.
   - Double-click on the 'Utilities' branch of the configuration tree.
   - Click 'Configuration' in the sub-navigation tree.
3. Choose the 'Save Configuration' option.
4. Select a configuration 'Index' number from the drop down.

Note: If you select an existing configuration, the following steps will overwrite it.

5. Tags simply name the configuration you are about to save. Choose either 'Use New Tag' and enter a tag in the space provided, or choose 'Preserve Old Tag' to re-save the configuration with its original name.
6. Press the 'Configure' button.

The selected system configuration is saved under the index number you selected in step 4, with the tag you specified in step 5.

Related Dialogs

"Config > Utilities > Configuration Dialog" on page 464

3.18.3 How to Simultaneously Save Several NetVX System Configurations (Snapshot Feature)

Abstract: *Vidiem™'s 'Snapshot' feature provides a way to read the configuration of several devices at the same time and to save those configurations to device files.*

1. Select 'Device > Snapshot' from the menubar to open the 'Device Snapshot' dialog.
2. Place a check mark in front of each device in the list from which you would like to capture a configuration.
3. Use the 'Browse' button to specify the target directory for device files.

4 Click the ‘OK’ button…

- Vidiem™ reads settings from every ‘checked’ device (step 2) it can access.
- Vidiem™ creates a configuration file in the target directory for each device it can read.
- Vidiem™ creates a log in the target directory with a name similar to: Snapshot_YYYY-MM-DD_HH-MM-SS.txt.
- Both successful reads and any errors, associated with device(s) Vidiem™ cannot access, are written to the log.
- Vidiem™ closes the ‘Device Snapshot’ dialog.

Related Dialogs

"Device Snapshot Dialog" on page 42

3.18.4 How to Load a NetVX System Configuration

1. Select 'Device > Read' from the menu bar to read the current system configuration.
2. Open the 'Configuration' dialog.
   - Double-click on the 'Utilities' branch of the configuration tree.
   - Click 'Configuration' in the sub-navigation tree.
3. Choose the 'Load Configuration' option.
4. Select a configuration from the 'Index' drop down list.
5. Press the 'Configure' button. The selected system configuration is now loaded onto the system.
6. Press the 'Close' button to close the dialog and cause Vidiem™ to initiate a read of the system configuration.

Related Dialogs

"Config > Utilities > Configuration Dialog" on page 464

3.18.5 How to Delete a NetVX System Configuration

1. Select 'Device > Read' from the menu bar to read the current system configuration.
2. Open the 'Configuration' dialog.
   - Double-click on the 'Utilities' branch of the configuration tree.
   - Click 'Configuration' in the sub-navigation tree.
3. Choose the 'Delete Configuration' option.
4. Select a configuration from the 'Index' drop down list.
5. Press the 'Configure' button to delete the selected system configuration.

Related Dialogs

"Config > Utilities > Configuration Dialog" on page 464

3.19 Module Profile Management Procedures

3.19.1 Overview of Module Profiles

A NetVX 'Module Profile' is a group of settings copied from a specific module and saved in memory.

When a profile is saved, it is automatically assigned to an index number between 1 and 99. A name may be assigned as well.

Using Vidiem™, the NetVX currently saves only encoder and decoder profiles.

Encoder Profiles include parameters of a branch but the following.

- Router Port In, Router Port Out
- Router Level

Decoder Profiles include all but the following command parameters.

- OSD Text
- Router Port In, Router Port Out
- Router Level

3.19.2 How to Save a Profile from a Branch

Abstract: *Use this procedure to copy the settings from the selected branch in to a Profile.*

1. Open the 'Profile' dialog.
   - Double-click on the 'Utilities' branch of the configuration tree.
   - Click 'Profile' in the sub-navigation tree.
2. Choose the 'Save Profile from Branch' option.
3. Use the drop down to select the branch from which you would like to save settings.
4. Choose the 'Save New Tag' option and enter a tag name.
   or
   If a profile name already exists and you want to update it...
   Choose the 'Preserve Old Tag' option.
5. Click the 'Configure' button to save the profile.

Related Dialog

"Config > Utilities > Profile Dialog" on page 467

3.19.3 How to List All Encoder and Decoder Profiles

Click 'NetVX > Utilities', then click the 'Profile' tab. The columns in this table indicate the profile index number, tag name, and branch.

3.19.4 How to Load a Profile into a Branch

1. Open the 'Profile' dialog.
   - Double-click on the 'Utilities' branch of the configuration tree.
   - Click 'Profile' in the sub-navigation tree.
2. Choose the 'Load Profile into Branch' option.
3. Use the drop down to choose the branch into which you would like load a saved profile.
4. Use the 'Profile Index' drop down to choose a saved profile to load into the selected branch.
5. Click the 'Configure' button to load the selected profile.

Related Dialog

"Config > Utilities > Profile Dialog" on page 467

3.19.5 How to Delete a Profile

1. Open the ‘Profile’ dialog.
    - Double-click on the ‘Utilities’ branch of the configuration tree.
    - Click ‘Profile’ in the sub-navigation tree.
2. Choose the ‘Delete Profile’ option.
3. Use the ‘Profile Index’ drop down to choose a saved profile to delete.
4. Click the ‘Configure’ button to load the profile.

Related Dialog

"Config > Utilities > Profile Dialog" on page 467

3.20 Status Monitoring Procedures

3.20.1 How to Monitor NetVX Status

Abstract: *Use this procedure to monitor a NetVX using Vidiem™.*

1. Open the Status Document Window by choosing 'View > Status'.
2. In the Navigation Pane (left side) place a check mark in the box next each device you wish to monitor. Actively monitored devices appear checked with their name in bold letters. Vidiem™ polls these devices for status at a user-specified Status Polling Interval.

3.20.2 How to Save Status Parameters to a File

Abstract: *Use this procedure to save NetVX status parameters to a file. The resulting file captures the state of all status parameters on all NetVXs listed in the status display at the time the file was saved.*

1. Choose 'View > Status' from the menubar to open the status view.
2. Choose 'File > Save As', then...
   - Select a file location.
   - Enter a filename.
   - Press 'Enter' to save the file.

3.20.3 How to Clear Module Status and Counter Values

Abstract: *Use this procedure to clear the system's various status counters*

1. Double-click the 'Utilities' branch in the navigation pane to open the 'Utilities' dialog.
2. Click the 'Clear Status' branch.
3. Check one or more check boxes and/or radio buttons representing items to clear.
4. (With 'Clear Module Status Counters' selected)
   Highlight any modules for which you want to clear status.
   - Click to select a single module.
   - Use 'Ctrl+Click' to select more than one module.
   - Use 'Shift+Click' to select a range of modules.
5. Press the Clear button.

Related Dialogs

"Config > Utilities > Clear Status Dialog" on page 463

3.21 Trap Log Procedures

3.21.1 How to View the Vidiem™ Trap Log

Select 'Tools > Trap Log' from the menu bar.

3.21.2 How to Save Trap Log Entries to a File

1. Select 'Tools > Trap Log' from the menu bar to open the 'Trap Log' dialog.
2. Click the 'Save' button at the bottom of the 'Trap Log' dialog. The system opens the 'Trap Log Filter'.
3. In the 'Trap Log Filter' dialog, use any of the following as needed.
    - Check the 'Start Time' box and specify range start time later than "12:00:00 AM 1/1/1970". If left unchecked, this value is used by default.
    - Check the 'End Time' box and specify a range end time earlier than the current date and time. If left unchecked, the current date and time is used by default.
    - Check the 'IP Address' box to isolate traps by their device name (from the Device List) or IP origin.
4. Click 'OK' to dismiss the dialog.
5. In the 'Save As' dialog, specify a name for the file and click 'Save'.

3.21.3 How to Acknowledge All Traps in the 'Current Log' Display

1. Open the 'Trap Log'. Select 'Tools > Trap Log' from the menu bar.
2. Highlight one or more traps.
    - Use 'Alt+Click' to select individual traps.
    - Use 'Shift+Click' to select a range of traps.
3. Press this 'Acknowledge' button to move trap entries to the 'History Log'.

3.21.4 How to Delete Traps from the 'History Log' Display

1. Open the 'Trap Log' to display the 'History Log'.
    - Select 'Tools > Trap Log' from the menu bar.
    - Click the 'History Log' radio button at the top of the display.
2. Highlight one or more traps.
    - Use 'Alt+Click' to select individual traps.
    - Use 'Shift+Click' to select a range of traps.

Note: The following action permanently deletes trap entries!

3. Press the 'Delete' button to delete the selected traps from the history log.

3.22 How to Configure Modules for BISS Scrambling and Descrambling

BISS Scrambling a Single Encoded Stream to Single Decoder (Backhauling Application)

If you need to scramble a basic, point to point (encoder to decoder) connection, then follow the steps in the following procedures.

- "How to Configure Encoders for BISS Scrambling" on page 162.
- "How to Configure Decoders for BISS Descrambling" on page 164.

BISS Scrambling Multiple Encoded Streams for Multiple Decoders

If you need to scramble connections between more than one encoder and possibly more than one decoder, then follow the steps in the sections listed above, then see "How to Use the BISS Keys Dialog to View Encrypted Session Words" on page 165. The BISS Keys Dialog helps make managing multiple scrambled connections easier.

3.22.1 How to Configure Encoders for BISS Scrambling

Abstract: *Use this procedure to apply BISS scrambling to one or more connections between modules.*

1. Open the encoder's 'Scrambling' dialog.
   - Select 'Modules > Encoders' and expand this branch.
   - Right-click on the desired encoder and choose 'Properties'.
   - Click 'Program > Scrambling' in the sub-navigation tree in the 'Encoder Properties' dialog.
2. Configure the encoder's 'Scrambling' settings.
   - Set the 'Encryption Mode' to 'BISS'.
   - Enter a 'BISS Session Word' or click the 'New' button to generate a valid string for this field.
   - Click on the 'Include in Global Scramblers' checkbox. Checking this box adds this encoder to the 'Scrambler' list which appears as a drop down at the top of the 'BISS Keys' dialog.

Note: The section labelled 'BISS Encrypted Session Word Tool' at the bottom of the dialog does not configure anything and may be ignored. These fields are provided as a mechanism to simply indicate the 'BISS Encrypted Session Word' which would result from the combination of the 'BISS Session Word' (which is a setting) and any valid 'Decoder Injected Identifier' (not a setting in this dialog) entered in the space provided. The 'Decoder Injected Identifier' setting is configured in the decoder's 'Descramblers' page.

3. Repeat step 1 and step 2 above for as many encoders as is desired.

Related Topics

- "Overview of BISS Scrambling" on page 56.
- "BISS Scrambling Dialogs" on page 56.
- "How to Configure Decoders for BISS Descrambling" on page 164.
- "How to Use the BISS Keys Dialog to View Encrypted Session Words" on page 165.
- "Config > Encoder > Program > Scrambling Dialog" on page 261.
- "Config > Decoder > Program > Descrambling Dialog" on page 302.
- "Config > Decoder > Program > Descrambling Injected Identifier Dialog" on page 303.

3.22.2 How to Configure a TMX Transmit Stream for BISS Scrambling

3.22.3 How to Configure Decoders for BISS Descrambling

Abstract: *Use this procedure to configure a decoder to descramble BISS-scrambled content.*

1 Open the decoder's 'Descrambling' dialog.
- Select 'Modules > Decoders' and expand this branch.
- Right-click on the desired decoder and choose 'Properties'.
- Click 'Program > Descrambling' in the sub-navigation tree in the 'Encoder Properties' dialog.

2 Configure the decoder's 'Descrambling' settings. You have a choice of either 'BISS Mode 1' or 'BISS Mode E'. Click on the radio button for the desired mode of BISS operation.

2a For 'BISS Mode 1'...
- Enter the 'Session Word' in the space provided.

2b For 'BISS Mode E'...
- Enter the 'Encrypted Session Word' in the space provided.
- Click the 'New' button to open the 'Injected Identifier' dialog.
- Enter a 'Injected Identifier' or click the 'New' button to generate a valid string for this field.
- Click on the 'Include in Global Descrambler List' checkbox. Checking this box adds this decoder to the list of descramblers appearing in the 'BISS Keys' dialog.
- Repeat the steps above for as many decoders as desired.

3 Select 'Device > Write…' to write these changes to the system.

Related Topics

- "Overview of BISS Scrambling" on page 56.
- "BISS Scrambling Dialogs" on page 56.
- "How to Configure Encoders for BISS Scrambling" on page 162.
- "How to Use the BISS Keys Dialog to View Encrypted Session Words" on page 165.
- "Config > Encoder > Program > Scrambling Dialog" on page 261.
- "Config > Decoder > Program > Descrambling Dialog" on page 302.
- "Config > Decoder > Program > Descrambling Injected Identifier Dialog" on page 303.

3.22.4 How to Use the BISS Keys Dialog to View Encrypted Session Words

1 Open the BISS Keys Dialog. This dialog displays the 'Encrypted Session Word' associated with each 'global' scrambler/descrambler (encoder/decoder) combination.

- Select a 'Scrambler' (encoder) from the drop down list. The lower 'Descramblers' portion of the dialog updates to display the 'Encrypted Session Word' that each decoder may use to descramble the signal originating on the selected 'Scrambler'.

2 At this point, the 'Descrambler' list may be used in a few different ways.

2a Copy an individual 'Encrypted Session Word':

- Copy an individual 'Encrypted Session Word' entry to the windows clipboard by right-clicking on the desired line and selecting 'copy'.

2b Save the entire table to a tab-delimited file. This file may, for example, be e-mailed, or posted on an internal network for use by those responsible for configuring decoders.

- Click 'Save As' to choose a file location.
- Specify a filename.
- Click 'Save' to save the current table in the display as a comma-delimited list of Device(s), Descrambler(s), and Encrypted Session Word(s).

Related Topics

- "Overview of BISS Scrambling" on page 56.
- "BISS Scrambling Dialogs" on page 56.
- "How to Configure Encoders for BISS Scrambling" on page 162
- "How to Configure Decoders for BISS Descrambling" on page 164
- "Config > Encoder > Program > Scrambling Dialog" on page 261.
- "Config > Decoder > Program > Descrambling Dialog" on page 302.
- "Config > Decoder > Program > Descrambling Injected Identifier Dialog" on page 303.

3.23 System Branch Procedures

3.23.1 How to Set the Network Time Server IP Address

1. Open the 'Fundamentals' dialog.
    - Select 'System' then right-click and select 'Properties'.
    - Choose 'Fundamentals' in the sub-navigation tree.
2. Enter the IP address of the network time server.
3. Press 'OK'.
4. Select 'Device > Write…' to write these changes to the system.

The NetVX compares its local time with the time server's every 64 seconds and makes any necessary corrections as specified in the NTP (Network Time Protocol). If no time server is specified, the time defaults to the system time saved in the NetVX.

Related Dialog

"Config > System > Fundamentals Dialog" on page 205

3.23.2 How to Configure the Logical IP Subnet (LIS) Table Entries

Abstract: *Use this procedure to specify the ATM IP Address and Subnet Mask on each Logical IP Subnet (LIS) on which this NetVX presents a host interface.*

The NetVX provides its ATM IP Address in response to Inverse ATM ARP requests from remote systems. Thereafter, remote systems, connected via IPOA, identify this system by the address specified for their respective Logical IP Subnet (LIS).

1. Select 'System > Logical IP Subnets + (right-click) Properties' in the configuration tree.
2. Configure each LIS entry.
    - Highlight an entry in the 'Logical IP Subnets' dialog.
    - (Optional) Enter a tag identifying this entry. This approach can help you to correlate LIS entries with their subnets.
    - Enter the 'IP address' representing this NetVX on the respective logical IP subnet. This entry is traditionally known as the 'IP ATM Address'.
    - Enter the 'IP Subnet Mask' used for IP devices on the subnet.
    - Select the network type. Use 'Ring' only if your NetVX is part of an ATM ring installation.
3. Press the 'OK' button to dismiss the 'Module Properties' dialog.
4. Select 'Device > Write…' to write these changes to the system.

Related Dialog

"Config > System > Logical IP Subnets Dialog" on page 221

3.23.3 How to Enable Router Information Protocol (RIP)

Abstract: *Use this procedure to enable RIP on the NetVX.*

The NetVX's Router Information Protocol (RIP) feature allows the system to periodically exchange IP routing information with its direct neighbors. RIP is described in IETF Drafts 1058 and 1723. When RIP is enabled, it allows the NetVX to function like a router by forwarding IP packets to the appropriate next hop in the network. When RIP is disabled, the routing table can be configured manually, but the system neither sends nor responds to RIP queries.

1. Enable RIP on the entire system
   - Select 'System > (right-click) Properties > Fundamentals'.
   - Check the box labeled 'Enable Routing Information Protocol'.
   - Click 'OK' to close the dialog.
2. Enable RIP on each Logical IP Subnet (LIS) on which the system has an interface. These interfaces are listed in the table in the 'Logical IP Subnets' branch of the configuration tree.
   - Select 'System > Logical IP Subnets > (right-click) Properties'.
   - Check the box labelled 'Enable Routing Information Protocol'.
   - Click 'OK' to close the dialog.
3. Activate RIP on the System Controller module.
   - Select 'Modules > IP Modules > SYS-G10 > (right-click) Properties'.
   - Check the box labeled 'Enable Routing Information Protocol'.
   - Click 'OK' to close the dialog.
4. Select 'Device > Write…' to write these changes to the system.

Related Topics

- "Config > System > Fundamentals Dialog" on page 205
- "How to Configure the NetVX to Support IP on ATM Bridging" on page 85
- "How to Configure an IPOA Ring Network" on page 88

3.24 Additional Serial Port Configuration Procedures

3.24.1 How to Use Telnet to Communicate with a Serial Port

Abstract: *Use this procedure to use Telnet to remotely access a NetVX serial port, and by extension, any external equipment connected to it.*

1. Open the 'Auxiliary Serial Ports' dialog.
   - Click 'System > Auxiliary Serial Ports'.
   - Right-click on 'Auxiliary Serial Ports' and select 'Properties'.
2. Select the desired serial port number from the 'Entries' list.
3. In the 'Function' drop down, select 'Telnet'.
4. Press 'OK'.
5. Select 'Device > Write…' to write these changes to the system.
6. The NetVX serial port configured above may now be accessed via Telnet using one of the following commands. Use '301' to access serial port 1. Use '302' to access serial port 2.

```
telnet <system IP address> 301
telnet <system IP address> 302
```

Related Topics

"Config > System > Auxiliary Serial Ports Dialog" on page 222

3.24.2 How to Use UDP to Communicate with a Serial Port

Abstract: *Use this procedure to configure a serial port for UDP communication The serial port may be connected to external equipment thereby providing remote access via the NetVX.*

1. Open the 'Auxiliary Serial Ports' dialog.
   - Click 'System > Auxiliary Serial Ports'.
   - Right-click on 'Auxiliary Serial Ports' and select 'Properties'.
2. Select the desired serial port number from the 'Entries' list.
3. In the 'Function' drop down, select 'UDP'.
4. Specify the 'IP Address' and 'UDP' port. Data entering the system via this serial port shall be sent, via UDP, to this address and port.
5. Press 'OK'.
6. Select 'Device > Write…' to write these changes to the system.
7. The NetVX serial port configured above may now be accessed using a UDP. The UDP connection must originate at the IP address and on the port specified above. Responses will be sent back to this same address and port.

Related Dialog

"Config > System > Auxiliary Serial Ports Dialog" on page 222

3.25 Key Configuration Procedures

3.25.1 How to Set the System Chassis Key

1. Open the 'Key' dialog.
    - Double-click on the 'Utilities' branch of the configuration tree.
    - Click 'Key' in the sub-navigation tree.
2. Choose the 'System Chassis' option.
3. Enter the 'Key String'.
4. Click the 'Apply Key' button to apply the key to the chassis.

Related Dialog

"Config > Utilities > Key Dialog" on page 466

3.25.2 How to Set a Module Key

1. Open the 'Key' dialog.
    - Double-click on the 'Utilities' branch of the configuration tree.
    - Click 'Key' in the sub-navigation tree.
2. Choose the 'Individual Module' option.
3. Highlight a module in the list.
4. Enter the 'Key String'.
5. Click the 'Apply Key' button to apply the key to the chassis.

Related Dialog

"Config > Utilities > Key Dialog" on page 466

3.26 System Password Procedures

3.26.1 The Default Telnet Password

The NetVX provides password protection for Telnet access and system access using the Upgrade.exe upgrade utility (included on the firmware disk). The NetVX is shipped with the following default login and password.

```
Login: admin
Password: admin
```

Related Procedure

"How to Change the NetVX System Password" on page 170

3.26.2 How to Change the NetVX System Password

You can change the password using either the craft port or the Telnet interface.

1. Open either the Telnet or the craft port interface. See
2. Enter the following to view the current password:
   ```
   util password
   ```
3. Enter the following to change the password:
   ```
   util password <new password>
   ```

Note: The NetVX's password is case-sensitive.

Related Procedure

"The Default Telnet Password" on page 170

3.27 System and Module Reset Procedures

3.27.1 How to Reset the System

1. Open the 'Reset' dialog.
    - Double-click on the 'Utilities' branch of the configuration tree.
    - Click 'Reset' in the sub-navigation tree.
2. Choose the 'Entire System' option.
3. Click the 'Reset Button'.

The system resets immediately.

Related Dialog

"Config > Utilities > Reset Dialog" on page 470

3.27.2 How to Reset Individual Modules

1. Open the 'Reset' dialog.
    - Double-click on the 'Utilities' branch of the configuration tree.
    - Click 'Reset' in the sub-navigation tree.
2. Choose the 'Individual Modules' option.
3. Highlight the desired module(s).
    - Click to select a single module.
    - Use 'Ctrl+Click' to select more than one module.
    - Use 'Shift+Click' to select a range of modules.
4. Click the 'Reset Button'.

The selected modules reset immediately.

Related Dialog

"Config > Utilities > Reset Dialog" on page 470

3.28 System Date and Time Procedures

3.28.1 How to Change the System Date and Time

1. Open the 'Set Time' dialog.
   - Double-click on the 'Utilities' branch of the configuration tree.
   - Click 'Set Time' in the sub-navigation tree.
2. Choose the 'Select UTC Date and Time' option.
3. Select the current date.
4. Select the current time.
5. Press the 'Set Time' button to set the NetVX's clock to the time specified.

Related Dialog

"Config > Utilities > Set Time Dialog" on page 471.
"Config > System > Fundamentals > Daylight Saving Time Dialog" on page 209

Related Procedures

"How to Configure the NetVX for Daylight Saving Time Transitions" on page 173.

3.28.2 How to Configure the NetVX for Daylight Saving Time Transitions

Abstract: *Use this procedure to configure the NetVX for the next transition either in to, or out of Daylight Saving Time.*

The NetVX uses its Daylight Saving Time variables to construct MPEG system information tables, such as the ATSC System Time Table (see ATSC A/65). While the NetVX's internal clock is in UTC, the DST transition parameters provide the minimum data points needed to construct the appropriate values for these system information tables.

The date/time should be given in local time (this is convenient for the operator and the system). An example transition out of DST occurred in the USA on 2003-10-26 02:00:00.

1. Go to the Daylight Saving Time dialog.
   - Right-click on 'System' in the configuration tree and select the 'Properties' option.
   - Double-click the 'Fundamentals' branch of the sub-navigation tree.
   - Click on the 'Daylight Saving Time' branch.
2. Choose the appropriate option for the next transition; either 'Begin Daylight Saving Time' (A, or G) or 'End Daylight Saving Time' (D).
3. Use the drop downs to select the 'Date' and the 'Time' of the next transition (A, D, and G)
4. Click 'OK'.
5. Select 'Device > Write…' to write these changes to the system.
6. Repeat this procedure once the set transition time has passed. If the transition time is not updated, then the NetVX will raise an Alarm (B and E) and send out a trap as a reminder about two months after the configured transition time has passed.

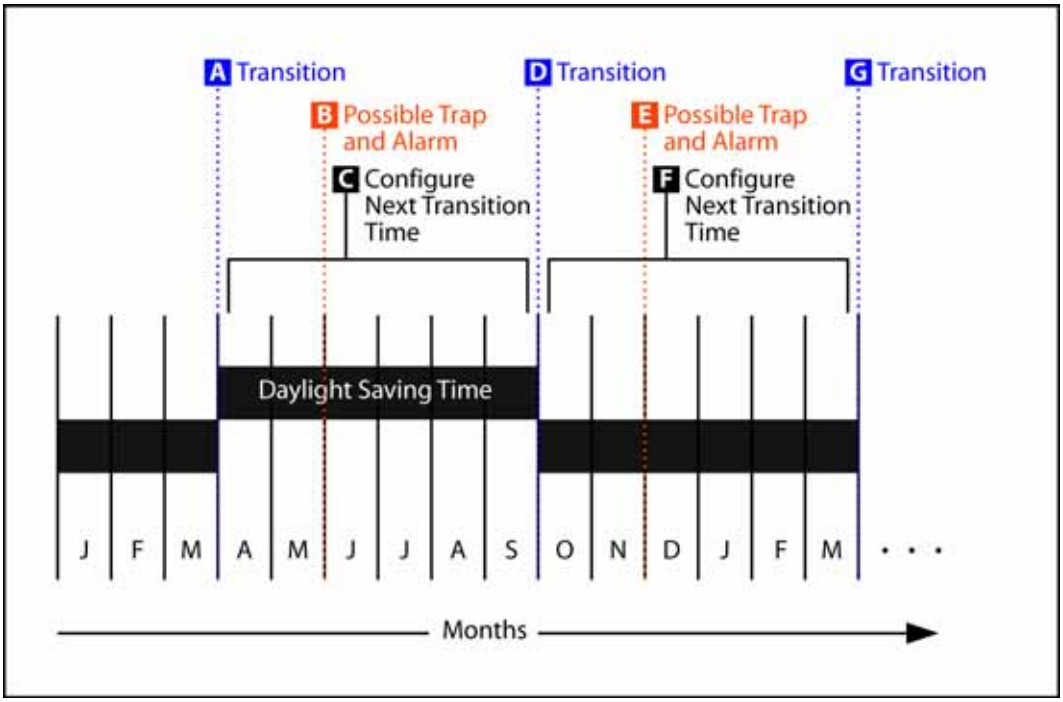

A Transition
D Transition
G Transition
B Possible Trap and Alarm
E Possible Trap and Alarm
C Configure Next Transition Time
F Configure Next Transition Time
Daylight Saving Time
J F M A M J J A S O N D J F M . . .
Months

Figure 3-23 Daylight Saving Transition, Alarm, and Configuration Timeline

Related Dialog

"Config > System > Fundamentals > Daylight Saving Time Dialog" on page 209.
"Config > Utilities > Set Time Dialog" on page 471

Related Procedures

"How to Change the System Date and Time" on page 172.

3.29 Miscellaneous

3.29.1 General Principles of Operation

Keep the following principles in mind when operating the Vidiem™ Element Management System.

Notes On Configuration and Status

- Configuration information is only as accurate as when it was last read from the system. From the menubar, select 'Device > Read' to read the current system configuration.
- Configuration changes do not affect the system until they are written to it. After making changes, select 'Device > Write' from the menubar to write changes to the system. For example, be sure to write the configuration to the system following making a series of changes to an encoder's video settings. This way, if a change is rejected by the system, it is easier to discern what area of the configuration may have caused the message to be rejected.
- Status information is only as accurate as when it was last read from the system. An exceedingly large status polling interval is generally not recommended for status monitoring. However, a very short polling interval may generate an undesirable amount of network traffic.
- Be aware of whether you are interacting with a configuration file on a PC or network file system, or real system on your network. See the topic "Vidiem™ Title Bars" on page 50 for details on how to quickly make this distinction.
- NetVX allows you to pre-configure any slot for a module before the module is actually installed in the system. In the status display, check the NetVX Module status icons below each slot to ensure a module is actually present before attempting to turn up a live service.

Notes On Multiple Users

- In organizations with multiple Vidiem™ users managing the same set of equipment, be sure to coordinate configuration control and hardware changes to prevent mis-configuration, or overwriting of configuration changes.
- The FlexiCoder DVS has craft port and SNMP (Vidiem™) control interfaces. NetVX has craft port, SNMP, Telnet, HTTP, and front panel control interfaces. Be aware of which interfaces are active on each system. Also be aware of when others may have access to these interfaces as otherwise unexpected changes may result.
- Vidiem™ logs some of its activities to the Windows Event Viewer. This activity log can be helpful in identifying some system-affecting changes. See "Windows Event Viewer" on page 175.

3.29.2 Windows Event Viewer

The Vidiem™ Element Management System sends messages logging certain events and activities to the Windows Event Viewer. Items logged include user access to Vidiem™ and some network interactions between Vidiem™ and the devices it controls.

The Event Viewer maintains a chronological log of each message it receives. These messages are useful for diagnosing the state of a device, and for tracing events leading up to a system fault, mis-configuration, or communication error. If you contact technical support, the technician may ask you to open the Event Viewer in order to gather diagnostic information.

Use the following OS-appropriate steps to access the Windows Event Viewer.

1. To open the Windows NT Event Viewer, select 'Start > Programs > Administrative Tools (Common) > Event Viewer'.
2. To open the Windows 2000 Event Viewer.
    - Select 'Start > Settings > Control Panel'.
    - Double-click the 'Event Viewer' icon.
    - Highlight the 'Application Log' entry in the event viewer.
3. To open the Windows XP Event Viewer, select 'Start > Programs > Administrative Tools > Event Viewer'.
4. In the Event Viewer...
    - Note the column labelled 'Source'. The Event Viewer displays Vidiem™ <release number> for each Vidiem™ entry.
    - Double click any Event Viewer entry to view its details.
    - The Event Viewer's own help system provides many details concerning its features.

Chapter 4: NetVX Configuration Display 4

4.1 Overview

Abstract: *This section describes Vidiem™'s Configuration Display provides access to all NetVX configuration tables, configuration dialogs, and configuration parameters.*

4.2 NetVX Navigation Tree

The navigation tree, on the left side of the screen, provides a persistent display of the NetVX configuration hierarchy.

Figure 4-1 Vidiem™ Configuration Tree

Click on branches in the Navigation tree to expand or to hide detail, and to move rapidly from one location in the hierarchy to another.

The topic "Overview of NetVX Interfaces and Addressing" on page 179 provides detailed descriptions of each element of the configuration tree.

Right click on any branch in the configuration tree to access Vidiem™'s pop up menu. The pop-up menu offers context-based options such as the following.

Cut, Copy, Paste

These options are typically not available.

Delete

Use this selection, where applicable, to delete the highlighted item.

Properties

Use this selection on items throughout the menu tree to quickly navigate to configuration dialogs.

4.3 Overview of the Configuration Display

The Composite Configuration Display provides a graphical depiction of the system's configured state. This view displays the module that each slot is configured to receive regardless of whether or not the module is physically present in the chassis. Use the Status View (View > Status) to verify which slots actually contain installed modules. See "NetVX Status Monitoring" on page 187 for complete details about the status view.

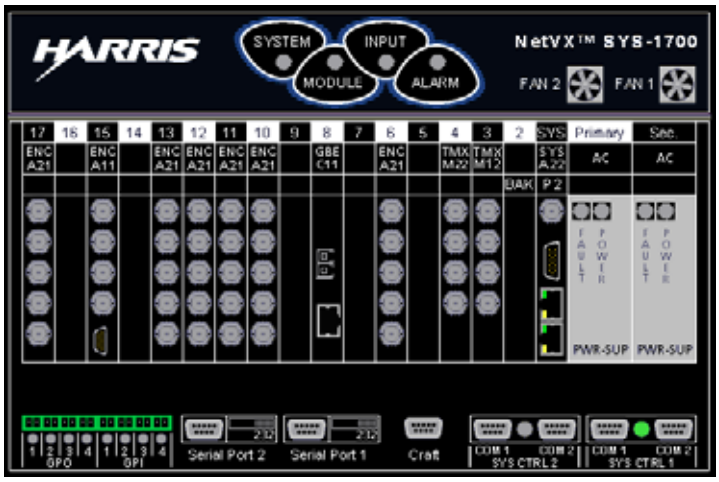


Figure 4-2 NetVX's Configuration Display

4.4 Configuration Table Display

Configuration tables display parameter names and settings. Double-click any row to open the respective Configuration Dialog.

Property	System
Tag	
Configuration Tag	
Chassis	Unknown
Max. Slot	17
Serial Number	unknown
Control	
Front Panel	Enabled
FTP Server	Enabled
HTTP Server	Enabled
SNMP Agent	Enabled
Telnet	Enabled
IP Address	135.17.61.236
MAC Address	00:00:00:00:00:00
IP Gateway	135.17.61.254
IP Subnet Mask	255.255.255.0
Time Server	0.0.0.0
Firmware Version	1.1.0
Build	02306325
Date	Thu Aug 1 10:16:11 EDT 2002
Title	Aastra VideoRunner (TM)

Figure 4-3 NetVX Configuration Table Display

4.5 Overview of NetVX Interfaces and Addressing

Vidiem™ groups like-type interfaces under the 'Modules' branch in the navigation tree.

Figure 4-4 Vidiem™'s Navigation Tree

Click the plus sign next to each branch to see the NetVX's actual, underlying physical interfaces. Use the links below to learn more about each type of NetVX interface.

- "Config > ATM Interfaces Table" on page 383.
- "Config > Encoders Table" on page 241.
- "Config > Decoders Table" on page 297.
- "Config > IP Modules Table" on page 403.
- "Config > TS Receivers Table" on page 311.
- "TS Transmitter Configuration" on page 321.
- "TS Demultiplexer Configuration" on page 349.
- "TS Multiplexer Configuration" on page 359.

See Also…

- "Overview of Navigation Tree Icons" on page 180.
- "Overview of Virtual Channels" on page 183.
- "Cross Connection Procedures" on page 146

4.6 Overview of Navigation Tree Icons

Abstract: *This topic describes the meaning of the icons elements that appear in the navigation tree.*

4.6.1 General Navigation Tree Icons

Use Vidiem™'s navigation tree to quickly create cross connections (XC) by dragging source elements (VCs, encoder modules, etc.) and dropping them on destination elements (VC, decoders, etc.). Vidiem™'s navigation tree icons indicate whether an element operates as a cross connection source or destination.

Green Icon Center

Indicates the channel, its interface, and its module are configured to be active. The end-point should transmit or receive data through the cross connection.

Orange Icon Center

Indicates the channel, its interface, or its module is configured as inactive. The end point will not be able to transmit or receive data through the cross connection until the configuration is changed.

White Icon Center

Indicates the VC is not associated with a cross connection.

Black Arrow Center

A black arrow indicates this source or destination is configured to operate with an XC.

White Arrow Center

A white arrow indicates this source or destination is not configured to operate with an XC.

Arrow Descriptions Arrows on the left or the right of the icons in the configuration tree indicate the role this VC plays in a cross connection (XC).	Green Center	Orange Center	White Center
XC source-only icons.			
XC destination-only icons.			
The VC is not a XC destination, but is an XC source.			–
The VC is an XC destination, and also an XC source.			–
The VC is an XC destination, but is not an XC source.			–
The VC is neither an XC destination nor an XC source.	–	–	

Vidiem™ ensures that cross connections link only sensible source and destination combinations. You may find that you need to alter a VC's bit rate or change a VC's 'Function' setting to cross connect desired source and destination items.

4.6.2 AUD-D14-Specific Navigation Tree Icons

Abstract: *This section describes the various states depicted by navigation tree icons associated with the AUD-D14 audio encoding and decoding module.*

Table 4-1 Associated Audio Encoder Icon States

Associated Audio Encoder Icon States	Module State	Activation State	Channel Operational Mode
These icons indicate states of an audio-only decoder that is associated with an audio/video decoder.			
These icons indicate states of an audio-only encoder that is associated with an audio/video encoder.			
White Interlocked Circles	Enabled	Deactivated	Associated
Amber Interlocked Circles	Disabled	Activated	Associated
Green Interlocked Circles	Enabled	Activated	Associated

Table 4-2 Audio-Only Encoder Icon States

Stand-Alone Audio Encoder Icon States	Module State	Activation State	Channel Operational Mode
White without Arrow	Enabled or Disabled	Deactivated	Standalone
White with Arrow	Enabled or Disabled	Activated	Standalone
Amber with Arrow	Disabled	Activated	Standalone
Green with Arrow	Enabled	Activated	Standalone

Table 4-3 Audio-Only Decoder Icon States

Stand-Alone Audio Decoder Icon States	Module Operational State	Channel Activation State	Channel Operational Mode
White without Arrow	Enabled or Disabled	Deactivated	Standalone
White with Arrow	Enabled or Disabled	Activated	Standalone
Amber with Arrow	Disabled	Activated	Standalone
Green with Arrow	Enabled	Activated	Standalone

Chapter 5: NetVX Virtual Channels & Cross Connections

5

5.1 Overview of Virtual Channels

Abstract: *This topic explains the concept of a Virtual Channel; a critical configuration element in NetVX signal routing.*

Virtual Channels (VC) provide source and destination connecting points for cross connections. Cross connections, in turn, link signals between modules. See the layer labeled 'Virtual Channels' in the illustration below.

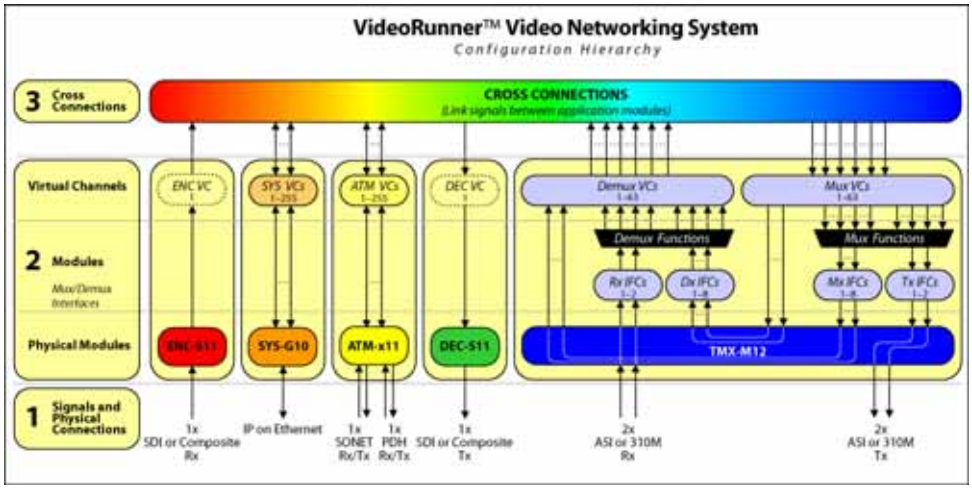


Figure 5-1 NetVX Configuration Hierarchy (Overview)

This diagram illustrates the various types of NetVX VCs and the respective modules on which they are located.

5.1.1 Encoders and Decoders Operate Like Virtual Channels

NetVX encoding and decoding modules do not have explicitly configured VCs like other modules. Instead each of these modules operate like a single, unidirectional VC. An encoder operates as a cross connection source. A decoder operates as a cross connection destination.

5.1.2 System Controller Virtual Channels

System Controller VCs receive and transmit IP on ATM signals. These signals are exchanged with other modules through cross connections. Cross connections use System Controller VCs, known as IP VCs, to link the System Controller's Ethernet interface with VCs on other modules.

Each System Controller supports up to 255 VCs. System Controller VCs are bidirectional. Therefore a VC operating as a source in one cross connection can also act as a destination in another cross connection.

5.1.3 GBE-C11 Network Interface Virtual Channels

System Controller VCs receive and transmit IP on ATM signals. These signals are exchanged with other modules through cross connections. Cross connections use System Controller VCs, known as IP VCs, to link the GBE-C11's 10/100/1000 BaseT interface with VCs on other modules.

Each GBE-C11 module supports up to 63 IP VCs using the 'High' level of Forward Error Correction (FEC), or up to 127 IP VCs using FEC set to 'Medium', 'Low', or 'None'. IP VCs are bidirectional. Therefore a VC operating as a source for one cross connection can also act as a destination in another cross connection.

Note: It's important to realize that the GBE-C11 processes all Video on IP (VoIP) traffic it receives directly, however all non-VoIP IP traffic is automatically forwarded to the active system controller. The active system controller performs all IP routing and forwarding functions for the NetVX Video Networking System.

5.1.4 ATM-x11 Network Interface Virtual Channels

ATM VCs transmit and receive ATM signals. These signals are exchanged with other modules through cross connections. Cross connections use ATM VCs to link the ATM module's physical interfaces with VCs other NetVX modules.

Each ATM module supports up to 255 VCs non-MPEG VCs, and up to 63 MPEG VCs. ATM VCs are bidirectional. Therefore a VC operating as a source for one cross connection can also act as a destination in another cross connection.

5.1.5 TMX-M12 Transport Stream Virtual Channels

The TMX uses two types of VCs to receive and transmit transport streams. Mux VCs are unidirectional and operate only as cross connection destinations. Demux VCs are also unidirectional, and operate only as cross connection sources. Each TMX module supports up to 63 Mux VCs and 63 Demux VCs.

Be sure to read the following related topics for a more complete understanding of NetVX signal routing.

Virtual Channel Related Procedures

- "Overview of NetVX Interfaces and Addressing" on page 179.
- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create a 'Copy' ATM Virtual Channel" on page 138.
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Delete a Virtual Channel" on page 144.
- "How to Route ATM Traffic According to VPI" on page 145.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.

5.2 Overview of Cross Connections

Cross Connections (abbreviated as XC) link signals between application modules. See layer 3 at the top of the following illustration. Cross Connections link encoder modules, decoder modules, and VCs on ATM, IP, and TMX modules. NetVX applies an index number in the range of 1 to 1024 to each cross connection and uses that number to group all configuration parameters defining the cross connection. Each NetVX supports up to 1024 cross connections.

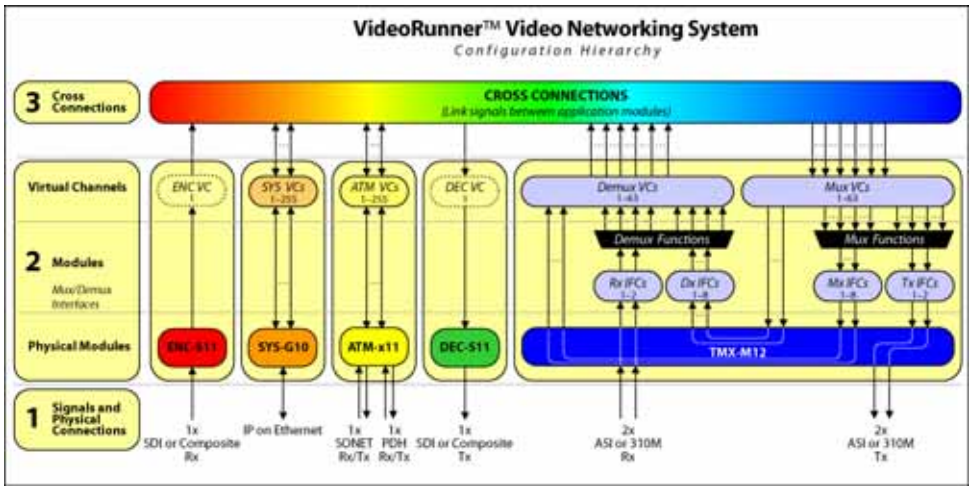


Figure 5-2 NetVX Configuration Hierarchy (Overview)

The following configuration parameters define each cross connection.

Tag

You can name each cross connection with a string of up to 31-characters in length.

Source

Each cross connection requires a source. The source may be any type of VC, or an encoder.

Destination

Each cross connection requires a destination. The source may be any type of VC or a decoder.

The drag and drop feature of Vidiem™'s navigation tree permit only legal source and destination combinations. Vidiem™'s Cross Connection Wizard prompts you for this information when creating a cross connection. See the following procedures for more details.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.

Virtual Channel Related Procedures

- "Overview of NetVX Interfaces and Addressing" on page 179.
- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create a 'Copy' ATM Virtual Channel" on page 138
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Delete a Virtual Channel" on page 144.
- "How to Route ATM Traffic According to VPI" on page 145.

Chapter 6: NetVX Status Monitoring

Status Tree, Display, and Dialogs

6

6.1 Overview of NetVX Status Monitoring

Vidiem™'s Status Document Window provides real-time status monitoring of any device registered by the Vidiem™ Management System. This window is divided into two parts, (a) the status tree, and (b) the status display.

- Click in (a) the "NetVX Status Display Navigation Tree" on page 188 in the left pane to view status tables.
- Use (b), the "Overview of the NetVX Status Display in Vidiem" on page 190 to view a depiction of the system state and LED status.

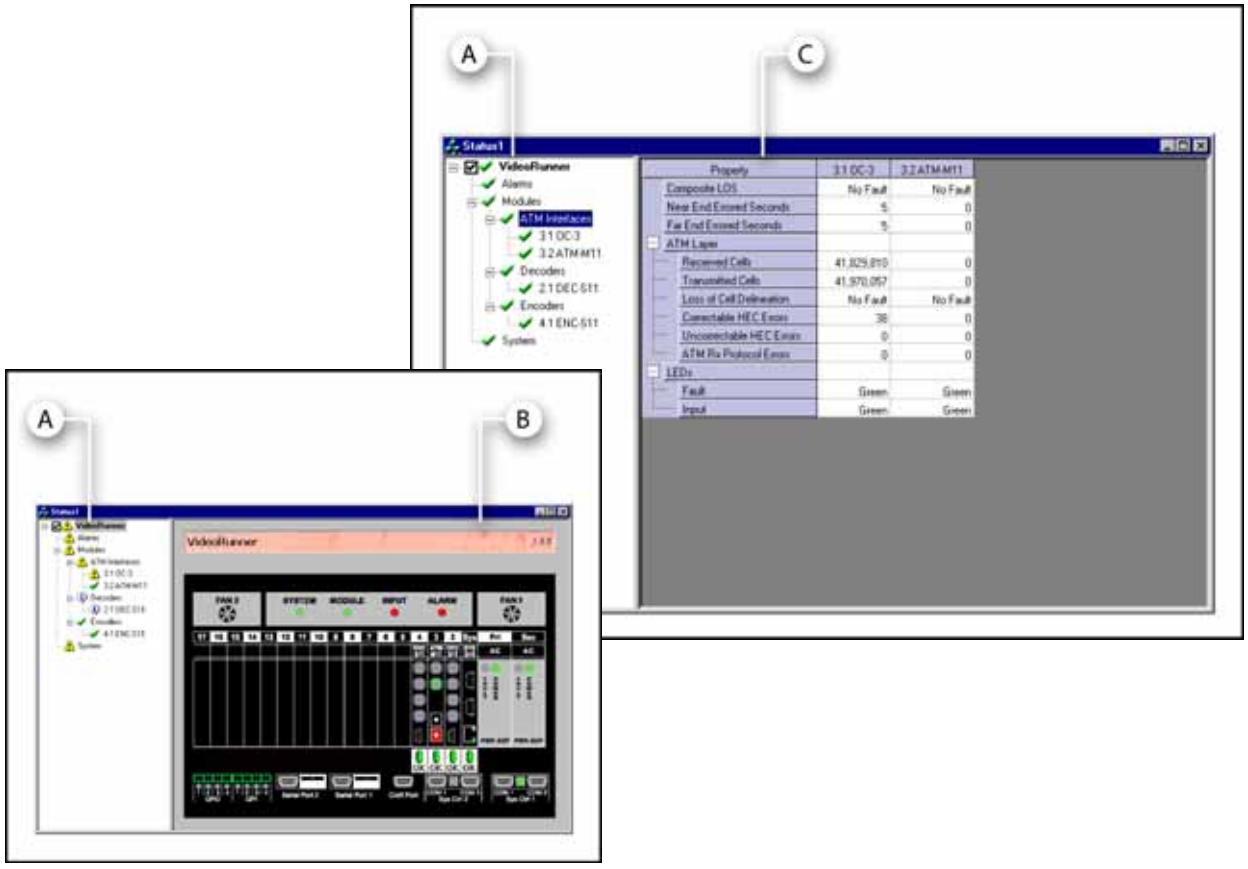


Figure 6-1 NetVX Status Window Displays

- Status tables (C) provide a listing of parameters related to each branch. Highlight any status table and press F1 for a description of the items in that table.

6.2 NetVX Status Display Navigation Tree

The status display provides a navigation tree populated with one main branch for each device listed in the Devices Dialog. Place a check mark (A) in the box at the highest level of the tree to monitor a given device. When monitoring a NetVX, the alarm status icon (B) next to the device name indicates the highest severity-level alarm currently affecting that device.

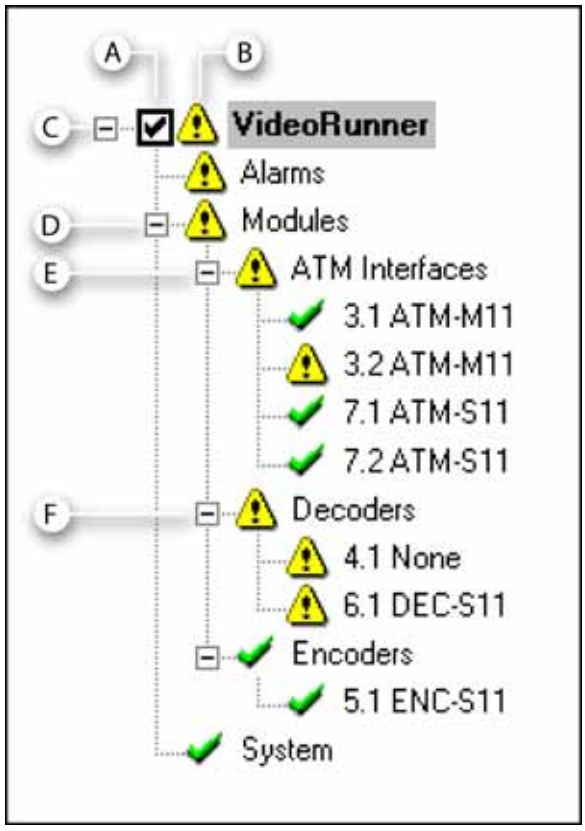


Figure 6-2 The NetVX Status Tree

Status icons at each level of the tree (D, E, and F) indicate the highest severity-level alarm affecting each branch.

6.3 NetVX Status Navigation Tree Icons

The Status Navigation tree displays the following Alarm Status Icons. Icons are listed by severity level ranging from most to least severe.

Icon	Icon Meaning
	Indicates the device or module reports at least one critical error.
	Indicates the device or module reports at least one major error.
	Indicates the device or module reports at least one minor error.
	Indicates the device or module provided a warning message.
	Indicates the device or module did not report any errors.
	Indicates Vidiem™ cannot display status for this device or module.

6.4 Overview of the NetVX Status Display in Vidiem

The Status Display provides a composite, graphical representation of the NetVX.

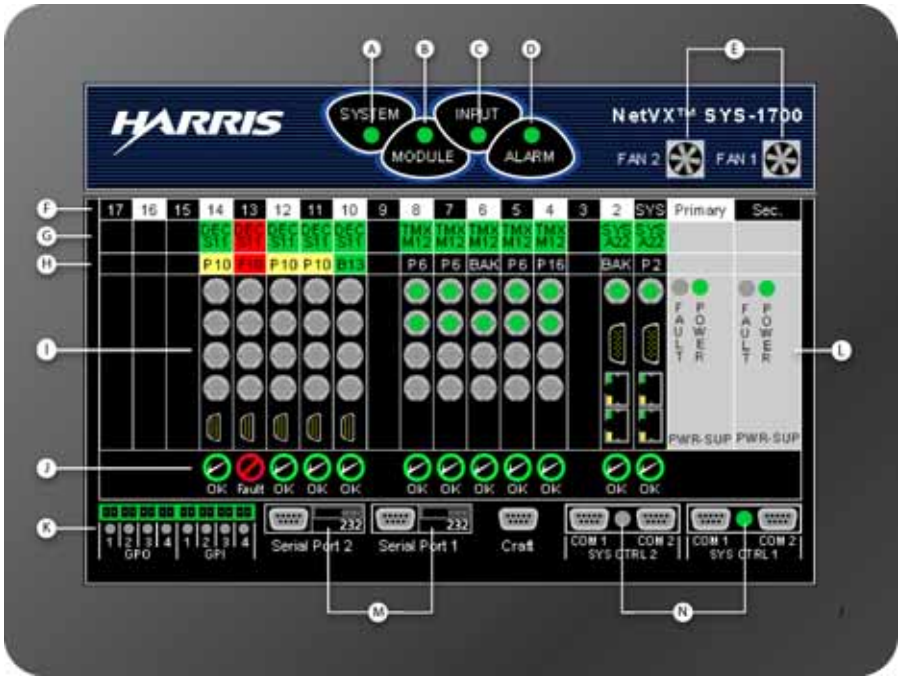


Figure 6-3 NetVX Status Display

Vidiem™ monitors and updates each of the following items every time it polls the system.

A See "System LED" on page 190 (below).

B See "Module LED" on page 191.

C See "Input LED" on page 191.

D See "Alarm LED" on page 191.

E See "Fan Icons" on page 191.

F Slot number labels

G These labels identify the type of module installed in each slot. These labels are dynamic and change color based upon the status of the module the represent.

H See "Overview of Slot Redundancy Labels" on page 192.

I See "Module Status Images" on page 193.

J See "NetVX Module State Icons" on page 201.

K See "GPI/GPO State" on page 200.

L See "Power Module Faceplate" on page 200.

M Serial port function icons. These icons indicate either 'RS-232' or 'RS-422' based upon the state of the function switch. A '?' question mark may be displayed if the state cannot be determined.

N See "System Controller Data Ports" on page 200.

System LED

The colors presented by this LED have the following meanings.

Green Indicates the NetVX is operating normally.

Amber Indicates either a non-service affecting hardware failure or the system controller is in an unknown state.

Red Indicates the NetVX is out of service, or should be taken out of service because a failure is imminent.

Module LED

The colors presented by this LED have the following meanings.

Green	Indicates fault LEDs on all enabled modules are green.
Amber	Indicates a module is booting or running diagnostics.
Red	Indicates a module should be replaced or repaired.

Input LED

The colors presented by this LED have the following meanings.

Green	Indicates input LEDs on all enabled modules are green.
Amber	Indicates an input is receiving bit errors.
Red	Indicates a loss of signal or framing on an input.

Alarm LED

The colors presented by this LED have the following meanings.

Green	Indicates no alarms are asserted.
Amber	Indicates a minor or a warning alarm is asserted.
Red	Indicates a major or a critical alarm is asserted.

6.4.1 Fan Icons

Fan icons indicate system fan state.

Icon	Icon Meaning
	Indicates the fan is operative.
	Indicates the fan is inoperative (and should be replaced).
	Indicates the fan state is unknown.

6.5 Overview of Slot Redundancy Labels

Abstract: *This topic describes Vidiem's 'Slot Redundancy Labels' which appear immediately above the module icons in image presented in Vidiem.*

Vidiem release 4.3.0 introduced slot redundancy labels.These labels indicate the state of system with regard to redundancy configuration, for the configuration interface, and actual module status for the status interface.

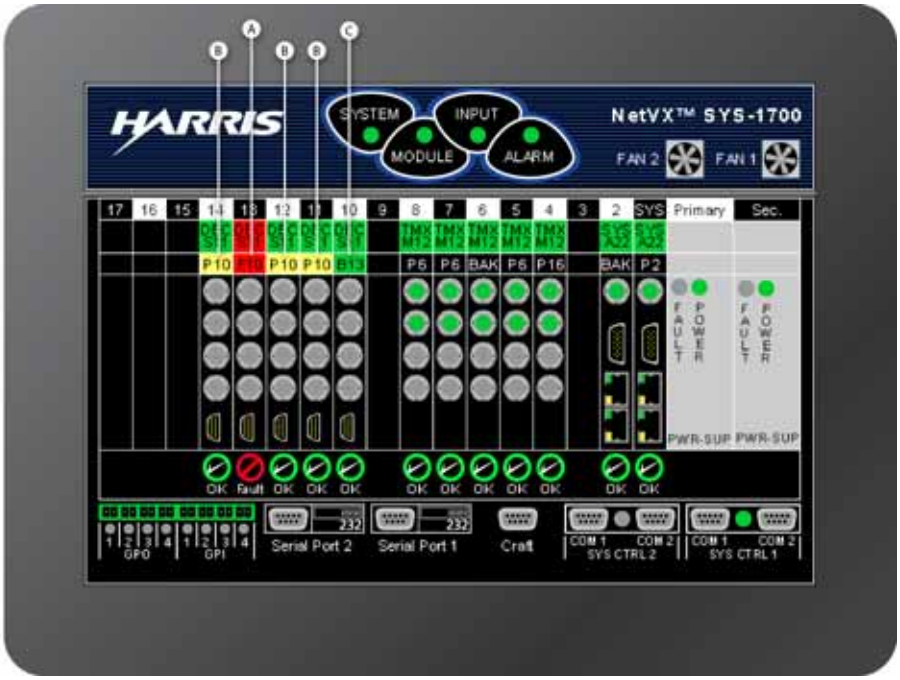


Figure 6-4 Vidiem's Slot Redundancy Labels

These labels mean the following.

(A) Red .....A red label indicates a failed or troubled module. The text 'F10' shown in Figure 6-4 above indicates the service which the module had been carrying has been failed over to slot 10.

(B) Amber .....The amber 'P10' labels in slots 14, 12, and 11 indicate that the backup module for each of these modules is not available.

(C) Green .....The green 'B13' label above the module image in slot 10 indicates the service which the backup module is currently carrying.

6.6 Module Status Images

Each NetVX slot is depicted with a graphical view of the module installed.

Vidiem™ represents the state of input signals with module images featuring dynamic, color-coded interconnects. The color displayed over each interconnect is a representation of the actual color of the neighboring input LED. Power module LEDs also provide status indications and are described here as well.

- Section 6.6.1, "ATM Module Faceplates" on page 193.
- Section 6.6.2, "ENC-Module Faceplates" on page 194.
- Section 6.6.3, "AUD-Module Faceplates" on page 195.
- Section 6.6.4, "ENC-Module Faceplates" on page 196.
- Section 6.6.5, "DEC-S11 Faceplates" on page 197.
- Section 6.6.6, "SYS-A12 SYS-A22 Faceplates" on page 197.
- Section 6.6.7, "TMX-M12 Faceplate" on page 198.
- Section 6.6.8, "TMX-M14 Faceplate" on page 199
- Section 6.6.9, "GBE-C11 Faceplate" on page 200.
- Section 6.6.10, "Power Module Faceplate" on page 200.

6.6.1 ATM Module Faceplates

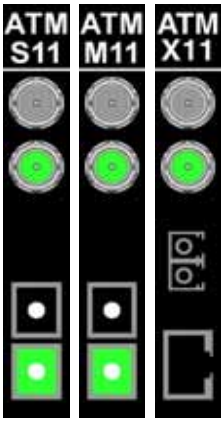


Figure 6-5 ATM Module Faceplate Representations

BNC and SC connector icons in this image reflect the state of the module's input LEDs. The connectors on this module are described from top to bottom below.

LED-2 (top) Indicates the state of the PDH input interface.

LED-3 (bottom) Indicates the state of the SONET/SDH signal.

LED States

OFF Indicates the interface is not configured for use.

Green No error indications.

Amber Indicates bit errors or AIS received.

Red Indicates a loss of signal or loss of framing.

6.6.2 ENC-Module Faceplates

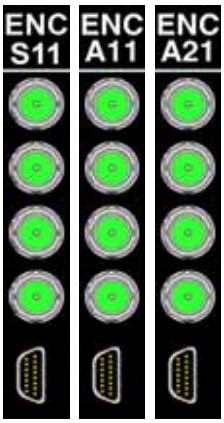


Figure 6-6 ENC-Module Faceplate Representations

BNC icons in this image reflect the state of the module's input LEDs. The BNC connectors on this module are described from top to bottom below.

LED-2 (top) Indicates the state of the composite analog video input.

LED 3 Indicates the state of the SMPTE 259M Serial Digital Interface (SDI) input.

LED 4 Indicates the state of the primary AES3 Digital Audio Input.

LED 5 Indicates the state of the secondary AES3 Digital Audio Input.

LED States

OFF Indicates the input is not configured for use.

Green Indicates the input signal is present and error-free.

Amber Indicates the input signal is present with errors.

Red Indicates a loss of signal or loss of framing.

6.6.3 AUD-Module Faceplates

Figure 6-7 AUD-Module Faceplate Representations

BNC icons in this image reflect the state of the module's input LEDs. The BNC connectors on this module are described from top to bottom below.

LED-2 (top)	Indicates the state of the AES3 Digital Audio Input 1.
LED 3	Indicates the state of the AES3 Digital Audio Input 2.
LED 4	Indicates the state of the AES3 Digital Audio Input 3.
LED 5	Indicates the state of the AES3 Digital Audio Input 4.

LED States

OFF	Indicates the input is not configured for use.
Green	Indicates the input signal is present and error-free.
Amber	Indicates the input signal is present with errors.
Red	Indicates a loss of signal or loss of framing.

6.6.4 ENC-Module Faceplates

Figure 6-8 ENC-H11-Module Faceplate Representation

BNC icons in this image reflect the state of the module's input LEDs. The BNC connectors on this module are described from top to bottom below.

LED-2 (top) Indicates the state of the composite analog video input.

LED 3 Indicates the state of the SMPTE 292M Serial Digital Interface (SDI) input.

LED 4 Indicates the state of the primary AES3 Digital Audio Input.

LED 5 Indicates the state of the secondary AES3 Digital Audio Input.

LED 6 Indicates the state of the tertiary AES3 Digital Audio Input.

ENC-H11 LED States

OFF Indicates the input is not configured for use.

Green Indicates the input signal is present and error-free.

Amber Indicates the input signal is present with errors.

Red Indicates a loss of signal or loss of framing.

6.6.5 DEC-S11 Faceplates

Figure 6-9 DEC-S11 Faceplate Representation

The DEC-S11 does not accept input from external equipment, and therefore does not have any input status LED's.

6.6.6 SYS-A12 SYS-A22 Faceplates

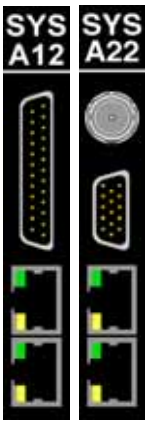


Figure 6-10 SYS-A12, and SYS-A22 Faceplate Representations

The SYS-A12, and SYS-A22 modules do not have input status LEDs.
The Ethernet rate and link status LEDs are statically displayed in Vidiem™ as shown above.

6.6.7 TMX-M12 Faceplate

Figure 6-11 TMX-M12 Faceplate Representation

The top two BNC icons in this image reflect the state of the module's input LEDs. The BNC connectors on this module are described from top to bottom below.

LED-2 (top) Indicates the state of SMPTE 310M/ASI input 1.

LED-3 Indicates the state of SMPTE 310M/ASI input 2.

TMX-M12 LED States

OFF Indicates the input is not configured for use.

Green Indicates the input signal is present and error-free.

Amber Indicates the input signal is present with errors.

Red Indicates a loss of signal or loss of framing.

6.6.8 TMX-M14 Faceplate

Figure 6-12 TMX-M14 Faceplate Representation

The TMX-M14 does not accept input from external equipment, and therefore does not have any input status LED's.

6.6.9 GBE-C11 Faceplate

Figure 6-13 GBE-C11 Faceplate Representation

The GBE-C11 module does not have any input status LEDs.

6.6.10 Power Module Faceplate

Figure 6-14 Power Module Representation

The state of the NetVX power module is also indicated through the status interface. A secondary power module must be installed for the system to report a major failure of the primary power module.

Fault LED States

Green	Indicates no power faults.
Amber	Indicates at least one power fault.

Power LED States

OFF	Indicates the power module is present, but not in use.
Green	Indicates the module is operational.

6.6.11 GPI/GPO State

A green illuminated LED image indicates an active GPI or GPO.

6.6.12 System Controller Data Ports

A green illuminated LED image indicates data ports for the active system controller.

6.6.13 NetVX Module State Icons

These icons indicate the state of the module installed in the corresponding slot.

Icon	Icon Meaning
	Indicates the module installed in this slot is in service
	Indicates the module installed in this slot is booting.
	Indicates the module installed in this slot is experiencing a fault.
	Indicates the module installed in this slot is installed but offline.
	Indicates the type of module installed in this slot is unknown.
	Indicates the type of module installed in this slot is different from the type of module the slot is configured to receive.
	Indicates this slot is configured to have a module in it, but it does not.

Chapter 7: NetVX System Branch

Configuration and Status Dialogs

7

7.1 System Branch

Abstract: *The 'System' branch of the navigation tree displays basic information about the system. System sub-branches organize and provide access to various system-wide controls.*

The table on the right provides a summary of settings related to system operation.

Note: Some settings in this table are permanently read-only.

7.1.1 Config > System > Fundamentals Tab

This tab provides a summary of all settings in this branch of the configuration tree.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

Tag

Displays the tag assigned to this system.

Configuration Tag

This field displays the tag of the configuration that is currently loaded into the system.

Power Supply

This field indicates the number of power supplies that the system is configured to operate with.

Daylight Saving Time Action

Indicates whether or not the system is configured to observe Daylight Saving Time.

Daylight Saving Time Transition Date

Indicates the date at which the

Model

This field indicates the NetVX chassis type. The chassis type may be specified when working with a file that is not associated with a particular system (e.g. after choosing 'File > New' from the menu bar).

Max. Slot

This field indicates this system's maximum number of application module slots.

Serial Number

This field indicates the unique manufacturing serial number assigned to this system.

Features

This field displays the hex code governing which features are enabled for use on this unit.

Control

This portion of the table indicates which control interfaces are enabled or disabled. The timeserver IP address is included here as well.

Program

Audio, Data, ECM, PCR, PMT, Video PIDs

This section indicates the current default PID assignments applied to each encoder and Demux VC.

Protection Address

Protection Multicast Address

This field indicates the multicast address used to signal those systems which are: (1) Located on the same subnet and (2) Can provide encoding support in the event of a module failure.

Protection Multicast TTL

This field indicates

Firmware Version

This field indicates version of the firmware that is currently running on the system.

Build

This field indicates the build number of the firmware that is currently running on the system. This field provides assistance to technical support.

Date

This field indicates the date on which the current firmware was created.

Identification

This field provides assistance to technical support.

Title

This field indicates the firmware title.

7.1.2 Config > System > Fundamentals Dialog

System

Tag

Use this field to enter a name for this NetVX system. The tag may be up to 31 characters long.

Configuration Tag

Use this field to specify a label for this configuration. Text entered here populates the 'Use New Tag' field of the "Config > Utilities > Configuration Dialog" on page 464.

Reference Source

Specifies the reference signal source. Given a composite reference signal (sometimes called 'black burst'), decoders and other equipment can lock their picture generation to the reference input. By synchronizing equipment to the same signal, a studio enables frame-accurate operations and avoids glitches in the broadcast signal.

ext-ntsc	The system uses an external signal, expected to be the NTSC frame rate of 29.97 frame/sec.
ext-pal	The system uses an external signal, expected to be the PAL frame rate of 25 frame/sec.
int-ntsc	The system uses an internal signal for the NTSC frame rate of 29.97 frame/sec.
int-pal	The system uses an internal signal for the PAL frame rate of 25 frame/sec.

Note: The SYS-A22 provides a reference signal input. Therefore, the two external settings are only available when the SYS-A22 module is used as the system controller.

Chassis Type

Indicates the system chassis type.

Please see the following topics for a matrix detailing the features available to each chassis type.

- "SYS-200 Chassis Types and Features" on page 472.
- "SYS-350 Chassis Types and Features" on page 473.
- "SYS-1700 Chassis Types and Features" on page 474.

Note: This field is disabled when working with a configuration file rather than a live system (as described in "How to Create a Device Configuration File Without a Device" on page 41.).

Firmware Version

Indicates the firmware version that is currently running on the system. This field is disabled when working with a file rather than a live system.

Power Supplies

User this control to specify the number of power supplies in the system chassis.

GPS/UTC Offset (Sec.)

Specifies the current GPS/UTC offset in seconds.

Global Positioning System (GPS) clocks derive their value from atomic timekeepers, without adjustment for the gradual slowing of the earth's rotation. On the other hand, UTC clocks are adjusted occasionally, using leap seconds to keep the 'wall clock time' coordinated with the earth's rotation and revolution around the sun. This value should be set to the current difference between the GPS and UTC clocks.

UTC = GPS - UTC Offset

The US Navy's Time Service Department maintains the official time standard for the US and posts updates when leap seconds are inserted. See the following URIs for details.

- http://tycho.usno.navy.mil/
- http://hpiers.obspm.fr/iers/bul/bulc/bulletinc.dat

Related Procedures

- "How to Enable Router Information Protocol (RIP)" on page 167.
- "How to Set the Network Time Server IP Address" on page 166.

7.1.3 Config > System > Fundamentals > Network Dialog

Addressing

In the Vidiem™ Element Management System, the IP address parameters as shown below are read-only in order to avoid a potential unrecoverable loss of remote connectivity. Use the NetVX's front panel or craft port interface to change IP address parameters.

IP Address (read only)
Displays the NetVX's IP address.

Ethernet Address (read only)
Displays the MAC address of the NetVX chassis.

IP Gateway Address (read only)
Displays the IP Gateway address of the NetVX's system controller.

IP Subnet Mask (read only)
Displays the IP subnet mask of the NetVX's system controller.

Enable DHCP
(Available n a future release) Indicates whether or not DHCP is enabled on the system control interface.

Enable Routing Information Protocol
Enables or disables the exchange of Router Information Protocol (RIP) information with other network elements on this subnet.

7.1.4 Config > System > Fundamentals > Program Dialog

Abstract: *The controls in this dialog provide a means to set system-wide default PID values. Generally these PID values are applied to any encoded program and any single-program transport stream (SPTS) carried on a Demux VC. These values may be replaced if PID values are manually specified as described in* "How to Manually Map VC PID Values on a Mux Interface" on page 115.

Audio Base PID

Specifies the initial (or 'base') packet identifier (PID) value to apply to packets carrying audio. If the program has multiple audio streams, subsequent PID values are assigned consecutively.

Data Base PID

Specifies the initial (or 'base') packet identifier (PID) value to apply to packets carrying data. If the program has multiple data streams, subsequent PIDs are assigned. Data services such as VBI, teletext, and ancillary data might appear to come and go in the input signal to an encoder. The NetVX encoders may used fixed offsets from this base data PID, giving data services fixed PIDs in the transport stream.

ECM Base PID

Specifies the initial (or 'base') packet identifier (PID) value to apply to packets carrying the stream's ECM (Entitlement Control Message) data. If the program has multiple ECM streams, subsequent PIDs are assigned consecutively.

PCR PID

Specifies the packet identifier to apply to packets carrying PCRs.

Encoders... The encoder's 'Use Separate PCR PID ' setting governs whether or not this parameter is used or ignored.

If the encoder is configured to transmit PCRs on the video PID (combined), this value is ignored.

If the encoder is configured to generate PCRs on a distinct PID (separate), then this value is used as the packet identifier.

Note: The system's PCR PID value should be distinct from the system's video PID (vidPid).

Demultiplexers.

.. When de-multiplexing transport streams, this parameter's value is used as necessary. The demultiplexer examines the incoming program to see if the PCR PID noted in the PMT matches a value in the PMT's stream table. If so, the demultiplexer automatically remaps the PCR PID value in the PMT to match the referenced stream (audio, video, etc.), and this pcrPid parameter is ignored. If the incoming PMT's PCR packet identifier does not match a stream in the PMT loop, this parameter's value gives the packet identifier for the outgoing program's remapped PCR PID. Finally, if the incoming program has no PCRs (indicated with a PCR PID value of 8191 in the PMT), the demultiplexer preserves 8191 in the outgoing program's PMT.

PMT PID

Specifies the packet identifier to apply to packets carrying the PMT.

Video PID

Specifies the packet identifier to apply to packets carrying video.

7.1.5 Config > System > Fundamentals > Daylight Saving Time Dialog

Abstract: *Use the controls in this dialog to specify how the NetVX should treat Daylight Saving Time transitions.*

The values selected in this dialog help construct MPEG system information tables, such as the ATSC System Time Table (see ATSC A/65). The system keeps its internal clock in UTC and does not maintain local time. Nevertheless, the DST transition parameters give a way to construct the appropriate values for the system information tables. The date/time should be given in local time (this is convenient for the operator and the system). An example transition out of DST occurred in the USA on 2003-10-26 02:00:00.

Daylight Saving Time Properties

Choose the appropriate checkbox below.

No Daylight Saving Time This option specifies that the system should not observe Daylight Saving Time.

Begin Daylight Saving Time This option specifies the date and time at which Daylight Saving Time should begin.

End Daylight Saving Time This option specifies the date and time at which Daylight Saving Time should end.

Date of Daylight Saving Time Transition

Use the drop downs to select the date and the time at which the transition should take place.

7.1.6 Config > System > Controls Dialog

Abstract: *Use the controls in this dialog to enable or disable various NetVX configuration and control interfaces.*

Control

Enable CCSP

Enables/disables CCS-P (Leitch Command and Control System Protocol).

Note: CCSP does not support setting the module type. That should be done through another control interface (SNMP, HTTP, craft, telnet). The configured module type is visible through CCSP, but is can not be configured using that interface.

Enable Front Panel

Enables/disables the front panel interface.

Enable FTP Server

Enables/disables the FTP server interface.

Enable HTTP Server

Enables/disables the HTTP server interface.

Enable Routing Information Protocol

Globally enables or disables the Router Information Protocol (RIP) for all interfaces on the system. This control is provided so that you can configure the system and enable RIP on the desired interfaces before RIP actually becomes active

Enable SNMP Agent

This control always reads 'enabled' when accessed through Vidiem™. Disabling SNMP disables communication between Vidiem™ and the NetVX. The craft port interface and the front panel interface both can disable the SNMP agent.

Enable Telnet

Enables/disables the telnet interface.

Time Server

Use this control to specify the IP address of the network time server. The NetVX compares its local time with the time server's every 64 seconds and makes any necessary corrections as specified in the NTP (Network Time Protocol). If no time server is specified, the time defaults to the system time saved in the NetVX. If a time server is not specified (e.g. IP Address 0.0.0.0) the time defaults to the NetVX's system time.

Protection

Protection MAC Address

Specifies the address handling during protection failover/failback. When equipped with an appropriate secondary system controller, a NetVX supports 1-for-1 redundancy on the primary controller module. To simplify external communication, the system presents one IP address for control, regardless of which system controller is active. If the primary system controller (in slot 1) fails, the backup controller (in slot 2) takes over operation of the system. As part of the transfer, the backup controller assumes "ownership" of the system's IP address.

From an external perspective, the NetVX IP address remains the same, although the address moves from one physical interface to another.

Connection-oriented services (such as those using TCP/IP) will drop during a failover, because the backup controller does not mirror the internal state of the primary.

Connection-less communications (UDP, SNMP, etc.) normally continue to operate. (Some packets may get lost, if they happen to be sent during the period of the address transfer.)

When the backup controller in slot 2 takes over for the failed controller in slot 1, the system copies configuration for slot 1 to slot 2. When the system restores service to slot 1, either through a reboot or a failback operation, the normal slot configuration is restored.

This parameter's value controls a second behavior during protection actions (either failover or failback).

dual-mac Use this option to let the primary and the backup modules each retain their unique MAC addresses during failover and failback operations. The modules share a single IP address, but they do not swap MAC addresses. Therefore when this option is used and the NetVX performs a failover from one system controller to another, external equipment will interact with one MAC address before failover and a second MAC address (associated with the backup system controller) after failover.

Some networking equipment have port security policies that try to detect spoofing. Such equipment disables communication with the device once it detects the “movement” of a known MAC address from one physical port to another and. When the NetVX system controller is connected to a device that has this feature enabled, the ‘dual-mac’ address handling should be used.

single-mac Use this option to let the primary and the backup modules move BOTH their IP and MAC addresses during failover and failback.

Many IP routers keep tables with pairs of IP and MAC addresses, using these values to route packets more quickly. Preserving the MAC address avoids ARP cache issues on external equipment, thus making failover and failback nearly transparent.

Note: This value currently applies only to system controllers and not to peripheral modules (such as GBE-C11).

Multicast Address

Use this control to specify the multicast address used to signal those systems which are:

(1) Located on the same subnet and

(2) Can provide encoding support in the event of a module failure.

An application module can have its service protected either locally or externally. When external protection is used and a failover occurs, the system controller broadcasts messages to find a system with a suitable backup for the failed module. This address specifies the multicast group to which these messages are sent. Only the group address and the multicast time-to-live value are under application control. The system uses a fixed UDP port.

The Internet Assigned Numbers Authority (IANA) defines the IP address ranges available for multicast addresses, and RFC 2365 specifies additional detail for these addresses. Using these sources, we recommend selecting a multicast address from the following list.

Table 7-1 IP Address Ranges Available for Multicast Addresses

Network Notation	Range	Notes
239.192.0.0/14	239.192.000.000 to 239.195.255.255	Organization-Local Scope
239.255.0.0/16	239.255.000.000 to 239.255.255.255	Site-Local Scope

Other values might be appropriate, if an organization has a range of addresses assigned by IANA. In general, however, the two ranges above should be appropriate for typical applications.

Multicast TTL

Use this field to specify the IP multicast time-to-live value for external module protection messages.

When external protection is used and a failover occurs, the system controller broadcasts messages to find a system with a suitable backup for the failed module. This parameter gives the time-to-live value for the outgoing messages. As the message goes through the network, each router decrements the time-to-live value. If the value reaches zero, the message is discarded.

To prevent immediate packet discards, the system uses an internal default value if the parameter is set to zero.

Related Topics

- Section 7.1.1, "Config > System > Fundamentals Tab" on page 203
- Section 7.1.3, "Config > System > Fundamentals > Network Dialog" on page 207
- Section 7.1.4, "Config > System > Fundamentals > Program Dialog" on page 208
- Section 7.1.6, "Config > System > Controls Dialog" on page 210

7.2 Cross Connections Branch

See "NetVX Configuration Procedures" on page 63 for an overview of cross connections and related procedures.

7.2.1 Config > System > Cross Connections Table

This table displays a summary of all configured cross connections on the system.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

Note: Left-click any column heading to sort the list of cross connections by the values in that column.

Tag

Lists the tag for each Cross Connection.

Source

Lists the slot, channel, and tag of the Cross Connection signal source.

Destination

Lists the slot, channel, and tag of the Cross Connection destination.

Function

Indicates the Cross Connection's function as determined by the source and destination channels with which it is associated.

Role

Indicates the redundancy role assigned to this cross connection. See the 'Role' control for details.

State

Indicates the current state (active/disabled) of the Cross Connection.

7.2.2 Config > System > Cross Connections Dialog

Cross Connection Properties

Entries

Lists all cross connections. Highlight the desired cross connection to inspect its settings.

Tag

Use this field to name this cross connection. The tag may be up to 31 characters long.

Source

Slot/Channel

Indicates the slot number and slot tag, as well as the channel number and channel tag of the source of the highlighted cross connection.

Destination

Slot/Channel

Indicates the slot number and slot tag, as well as the channel number and channel tag of the source of the highlighted cross connection.

State

Use this control to read and to configure the state of one or more cross connections (XCs).

active The entry is allocated and enabled for service. As described above, the system checks various rules before activating an entry.

backup Configures this entry for a backup role, as Redundancy describes above. Its corresponding primary entry will have an active state and matching destination slot and destination channel values. No more than one backup entry should exist for a given primary connection. A connection in the backup state is considered to be in service, although it carries no traffic. If the corresponding primary connection fails, the backup's state changes to active, and the backup starts carrying traffic.

create To create a new entry in the table, a manager selects the next available index and tries to set that row's state to create. If the index is valid and that row is not allocated in the table, the system creates a new row at the specified index. After creating a new row in the table, the system sets its state to "inactive".

destroy Setting a row's state to this value eliminates the row from the table. Any row can be destroyed, regardless of its current state or whether it actually exists.

inactive The entry is allocated but not currently carrying a service.

Role

Use this control to read and to configure the cross connection's role in providing service and service protection.

primary A cross connection in this role carries the service when the cross connection source is operating as intended.

Alarming – The system issues a 'Service Degrade: Protection Switch' event when a service is switched between two primary cross connections. Note: This type of switch is distinct from a 'failover' which is described in the two cases below.

revertive A cross connection in this role carries the service only when the source of the 'primary' cross connection has failed.

In the event that the 'primary' cross connection's source fails, the system transitions to this cross connection by making its 'State' 'active' and the 'primary' cross connection's rowstate 'inactive'.

A cross connection in this role automatically fails back to the 'primary' cross connection when the primary's source is restored and it's rowstate again becomes 'active'.

Alarming – The system raises a 'Service Degrade: Primary Failover' during the entire period in which the 'Secondary' cross connection is active.

secondary A cross connection in this role carries the service only when the source of the 'primary' cross connection has failed.

In the event that the 'primary' cross connection's source fails, the system transitions to this cross connection by making its state 'State' 'active' and the 'primary' cross connection's rowstate 'inactive'.

Unlike the 'revertive' role (described above), a cross connection in this role does not automatically failback to the 'primary' cross connection when it's source is restored and it's rowstate again becomes 'active', instead failback must be manually initiated.

Alarming – The system raises a 'Service Degrade: Primary Failover' during the entire period in which the 'Secondary' cross connection is active.

Delete

Highlight a cross connection and use this button to delete it.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.
- "How to Create an ATM Virtual Channel" on page 136.

7.3 Alarms Branch

7.3.1 Overview of NetVX Alarms

7.3.1.1 Degrade and Fault Alarms

There are two types of NetVX alarms.

Degrade A degrade alarm indicates a problem causing service to degrade but not a loss of service.

Fault A fault alarm indicates a problem causing a loss of service.

Each alarm type also has one or more sub-types. While 'Audio Degrade' is one example of an alarm type more specific alarms, 'Channel Not Present', 'CRC Errors', and 'Format Not Supported' are Audio Degrade alarm sub-types. Every alarm either a degrade alarm or a fault alarm and each is assigned a severity level.

7.3.1.2 Definitions of Alarm Severities

You can assign any of the following severity levels to any alarm type and its sub-types will receive the same assignment.

Warning Assign the warning alarm severity level to alarm conditions that warrant attention, but do not affect the operation of the system. Example: An interface that encounters sporadic, correctable errors might assert a warning alarm.

Minor Assign the minor alarm severity level to relatively unimportant alarm conditions that may affect the overall operation of the system.

Major Assign the major alarm severity level to important alarm conditions affecting the output of the system. A major alarm might be used to indicate complete loss of video input to encoders, for example.

Critical Assign the critical alarm severity level to alarm conditions affecting the NetVX and having the potential to affect other systems as well.

None Assign this value to an alarm to disable it.

7.3.2 Config > System > Alarms Table

This table summarizes all System Alarm settings.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

See the topic "Overview of NetVX Alarms" on page 214 for detailed alarm descriptions.

7.3.3 Config > System > General Alarms Dialog

Use these controls to specify severity levels for groups of NetVX alarms.

Note: The NetVX maintains a list of current alarms. Go to 'Status > Alarms > Current Tab' to view a grid of all current alarms listed in severity-order: Critical, Major, Minor, Warning.

Severity (column)

The topic "Overview of NetVX Alarms" on page 214 provides descriptions of alarm 'Severity" 'Degrade' and 'Fault' alarm types.

Decode Degrade

See "Decoder Degrade Alarms" on page 486

Service Degrade

See "Service Degrade Alarms" on page 496.

Service Fault

See "Service Fault Alarm" on page 497.

System Degrade

See "System Degrade Alarm" on page 498.

System Fault

See "System Fault Alarms" on page 501.

Use Defaults

Press this button to change the severity settings in this dialog back to their defaults.

7.3.4 Config > System > Alarms > Coding Alarms Dialog

Use these controls to specify severity levels for coding-related NetVX alarms.

Note: The NetVX maintains a list of current alarms. Go to 'Status > Alarms > Current Tab' to view a grid of all current alarms listed in severity-order: Critical, Major, Minor, Warning.

Severity (column)

The topic "Overview of NetVX Alarms" on page 214 provides descriptions of alarm 'Severity" 'Degrade' and 'Fault' alarm types.

Delay (column)

-1	This value disables service protection for this alarm type.
0	This value causes service protection to be triggered immediately when this alarm type occurs.
1 to 120	This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Links to descriptions of groups shown in this dialog are provided below.

Audio Degrade

See "Audio Degrade Alarms" on page 484.

Audio Fault

See "Audio Fault Alarm" on page 485.

VANC Degrade

See "VANC Degrade Alarm" on page 503.

VBI Degrade

See "VBI Degrade Alarm" on page 503.

Video Degrade

See "Video Degrade Alarms" on page 509.

Video Fault

See "Video Fault Alarm" on page 510.

Use Defaults

Press this button to change all settings in this dialog back to the system's default settings.

7.3.5 Config > System > Alarms > Service Protection Dialog

Use these controls to specify severity levels for service-related NetVX alarms.

Note: The NetVX maintains a list of current alarms. Go to 'Status > Alarms > Current Tab' to view a grid of all current alarms listed in severity-order: Critical, Major, Minor, Warning.

Severity (column)

The topic "Overview of NetVX Alarms" on page 214 provides descriptions of alarm 'Severity" 'Degrade' and 'Fault' alarm types.

Delay (column)

-1	This value disables service protection for this alarm type.
0	This value causes service protection to be triggered immediately when this alarm type occurs.
1 to 120	This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Links to descriptions of groups shown in this dialog are provided below.

Module Degrade

See "Module Degrade Alarms" on page 489.

Module Fault

See "Module Fault Alarms" on page 492.

Network Degrade

See "Network Degrade Alarms" on page 493.

Network Fault

See "Network Fault Alarms" on page 495.

VC Degrade

See "VC Degrade Alarms" on page 504.

VC Fault

See "VC Fault Alarm" on page 509.

Use Defaults

Press this button to change all settings in this dialog back to the system's default settings.

7.4 GPI Contacts Branch

7.4.1 GPI Contacts Overview

The SYS-1700 provides four General Purpose Inputs (GPI) on the rear of the chassis. The SYS-300 provides three General Purpose Inputs (GPI) on the rear of the chassis.

Each GPI pair is composed of a 5 volt source and a ground. The GPI is triggered when the system senses a minimum of 5 milliampere of current. The corresponding LED below each GPI pair illuminates whenever the NetVX is powered and the GPI is triggered.

7.4.2 Config > System > GPI Contacts Table

This table displays a summary of all GPI relay settings.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

7.4.3 Config > System > GPI Contacts Dialog

Entries

Lists each GPI contact closure. Highlight the desired GPI number to edit associated functions (described below).

Function

No Action

Choose this option to have no action take place when the GPI is either opened or closed.

Alarm on Close

Choose this option to trigger an alarm when the GPI is closed.

Alarm on Open

Choose this option to trigger an alarm when the GPI is opened.

Splice

This value lets encoders receive notification when the GPI changes state. It can be used to trigger splice point insertion. See the 'Related Procedures' section below for links to more detailed topics.

Load Stored Configuration

Choose this option and select a configuration number from the drop down list to configure the system to load a stored configuration when the GPI circuit is closed.

Related Dialogs

"Config > Utilities > Configuration Dialog" on page 464

Related Procedures

- "How to Configure an Encoder to Receive GPI-Triggered Splice Points" on page 71.
- "How to Save a NetVX System Configuration" on page 155.
- "How to Load a NetVX System Configuration" on page 157.
- "How to Delete a NetVX System Configuration" on page 157.

7.5 GPO Relays Branch

7.5.1 GPO Relays Overview

The NetVX's (General Purpose Outputs) GPOs provide triggers to external equipment to notify users of certain system operations. GPOs are normally open when the NetVX is receiving power.

The SYS-1700 provides four General Purpose Outputs (GPO) on the rear of the chassis. The SYS-300 provides three General Purpose Outputs (GPO) on the rear of the chassis.

Through software configuration, each GPO can be linked to either an alarm event of a specific severity or a backup protection module becoming active. Each GPO circuit can carry up to ±75 volts with a 300 Ohm load.

The corresponding LED below each GPO pair illuminates whenever the system is powered and the GPO circuit is closed. All GPOs circuits are closed when the NetVX is not powered.

7.5.2 Config > System > GPO Relays Table

This table displays a summary of all GPO relay settings.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

7.5.3 Config > System > GPO Relays Dialog

Entries

Lists each GPO contact closure. Highlight the desired GPO number to edit associated functions (described below).

Function

Open/Closed

Select the desired option to manually set the GPO to either open or closed.

XC-Failover

This value associates a GPO with a cross-connection failover.

If any entry in the cross connection table goes through an automatic service protection action, the GPO closes and stays closed for five seconds. If several failovers occur in overlapping sequence, the GPO opens five seconds after the last failover occurs.

This function applies only to automatic failovers, and not to manually-initiated failovers.

Alarm Activation

Choose this option to trigger the GPO to close when an alarm is activated. Use the drop down list to indicate the severity of alarm responsible for this trigger.

Protection Failover

This control serves two functions.

(1) Use this control to trigger the GPO to close when the specified 'Backup' module takes over for a main module.

Use the drop down list to select the slot number of the backup module responsible for this trigger.

(2) Use this control to trigger the GPO to close when the specified 'Main' module either:

- Experiences a 'Protection Fault' or…
- Experiences a state whereby it Is 'Enabled', but not 'In Service'.

Use the drop down list to select the slot number of the main module responsible for this trigger. Note: The selection indicates 'Backup-#' even when used in this manner.

This selection cannot be used with any module that either has a 'Backup' or is a 'Backup'.

Service Alarm

Use this option to configure the system to close the specified GPO relay when a 'Service Degrade' or a 'Service Fault' alarm condition occurs on either a specific cross connection or on any cross connection. The GPO stays closed as long as such an alarm is asserted.

Service Alarm (drop-down)

The association of this function with either any cross connection, or one particular cross connection.

0, Any Service This option associates the GPO with any cross connection.

#, <name> This option associates the GPO with a particular cross connection.

7.6 Logical IP Subnets Branch

7.6.1 Config > System > Logical IP Subnet Table

This table displays summary information about each Logical IP Subnet (LIS) to which the NetVX has access.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

7.6.2 Config > System > Logical IP Subnets Dialog

Use the controls in this dialog to configure each logical IP subnet to which the NetVX has access.

Logical IP Subnets Properties

Entries

Each entry represents a subnet on which this system has an interface. Use the other controls in this dialog to define each such interface.

Tag

Use this field to identify each LIS. For any LIS entry, if the IP address is set but the tag is not, then the IP address is used as the tag. Setting the tag overrides this behavior.

Note: The IP address and IP subnet mask together form a network address. Vidiem™ (and NetVX) require each network address to be unique.

IP Address

Specifies the IP address identifying this system on the selected Logical IP Subnet (LIS).

IP Subnet Mask

Specifies the subnet mask used to reach this system.

Network Type

Specifies the structure of the specified IP subnet.

Mesh The ATM network forms a mesh. Each NetVX has a bidirectional network link.

Unidirectional Ring (Planned for a future release)
The general physical topology is a ring, but each system communicates in only one direction.

Enable Routing Information Protocol

Enables or disables the exchange of Router Information Protocol (RIP) information with other network elements on this LIS.

7.7 Auxiliary Serial Ports Branch

7.7.1 Config > System > Auxiliary Serial Ports Table

This table displays summary information about the NetVX's serial port settings.
In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

7.7.2 Config > System > Auxiliary Serial Ports Dialog

Use the controls in this dialog to configure the NetVX's serial ports.

Entries

Use this control to select the serial port that you want to configure.

Baud Rate

Use this control to set the baud rate for the selected serial port.

Function

Use this control to set the serial port's mode of operation.

Automation	(Available in a future release) Serial port communications use the NetVX's automation control protocol.
Router, GVG Native	(Available in a future release) The serial port will carry router control commands using the Grass Valley Group's 'Native Protocol' [Routing Products Protocol Manual, document 071020102, July 2001, Grass Valley Group].
Router, Leitch	Serial port communications use Leitch's router control protocol.
Router, Miranda	(Available in a future release) The serial port will carry router control commands using the Miranda protocol, as documented in Network Control System by Network Electronics AS for the Network VikinX routers.
Telnet	Use this function to connect to a serial port via a telnet session. When a normal telnet client connects to port 23, and the system gives that session a command interpreter. When a telnet client connects to port 300+index, the system gives that session read/write access to serial port index. Characters received from the telnet session are written to the serial port; characters received from the serial port are written to the telnet session.
UDP	Use this function to provide read/write access to the serial port via UDP. Characters received from the serial port are transmitted to the configured IP address and UDP port. Similarly, characters received on UDP port 300+index are written to serial port index. The system accepts all UDP characters, regardless of the sender's IP address. The serial port's IP address applies to characters being transmitted to the network, not received from the network.

Baud Rate

Use this control to set the baud rate for the selected serial port.

UDP Transmission

The following controls are applicable only when the 'Function' (above) is set to 'UDP'. In this mode, data received through the selected serial port is transmitted, using UDP, to the specified IP address and port.

IP Address

Specifies the IP address of the network destination for data entering the system through this serial port.

Port

Specifies the UDP port of the network destination for data entering the system through this serial port.

301 Use port 301 to send data to serial port 1 on the remote NetVX.

302 Use port 302 to send data to serial port 2 on the remote NetVX.

Related Procedures

- "How to Use Telnet to Communicate with a Serial Port" on page 168
- "How to Use UDP to Communicate with a Serial Port" on page 168

7.8 Trap Destinations Branch

7.8.1 Config > System > Trap Destinations Table

This table displays a summary of all trap destinations.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

7.8.2 Config > System > Trap Destinations Dialog

These controls let you specify an IP address for each of up to ten different trap receivers. When a trap is triggered, a trap message is sent to each of these receivers. If the receiving device is a Windows PC with the Vidiem™ Element Management System installed on it, then any traps received are presented in the trap log.

Using Vidiem's menu bar, select 'Tools > Trap Log' to open the Trap Log display.

Entries

Lists the tag for each trap destination. Highlight an entry to make changes.

Tag

Use this field to enter a descriptive tag uniquely distinguishing the selected trap destination. The tag may be up to 31 characters long.

IP Address

Use this control to set or check the trap IP address. The trap IP address identifies the device that receives NetVX trap messages.

Minimum Alarm Severity

Use this drop down to choose the minimum alarm severity required to trigger the emission of a trap to the highlighted destination entry.

None	No trap message is sent.
Warning	A trap is sent as the result of any alarm.
Minor	A trap is sent as the result of any alarm of minor severity or greater.
Major	A trap is sent as the result of any alarm of major severity or greater.
Critical	A trap is sent only as the result of critical fault conditions.

7.9 Config > System > CA Scrambling Control Groups Branch

This table displays each of the NetVX's 'Scrambling Control Groups'.
Double-click any white cell in the table to open 'CA Properties' to the respective 'Scrambling Control Group'.

7.9.1 Config > System > CA Scrambling Control Groups > CA SCG # Branch

This tab lists basic details of the selected Conditional Access Scrambling Control Groups (CASCG).
Double-click on any white cell in the grid to open the 'CA Properties' dialog to this branch's 'Scrambling Control Group' dialog.

7.9.2 Config > System > CA Scrambling Control Groups > CA SCG # > CA SCG Tab

Tag
The user-defined name for this Scrambling Control Group.

Crypto Period
This is the suggested crypto period. The actual crypto period is negotiated at the connection to an ECMG.

Transport Stream ID
This must match a TSID of the interface where the VC's referencing the SCG are attached

7.9.3 Config > System > CA Scrambling Control Groups > CA SCG # > ECM Tab

State
Indicates whether or not this ECM is active.

PID
PID to use for ECM. Must be unique across all PIDs in multiplex.

Service ID
The assigned service ID. This typically is the program number in the transport multiplex.

System Index
This is the index of the CAS entry that is associated with the ECM. Used to find an appropriate ECMG to attach the ECM to.

7.10 Config > System > CA Properties Dialogs

7.10.1 Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG Dialog

SCG Control

Entries (list)
Lists each Scrambling Control Group.

Tag
The user-defined name for this Scrambling Control Group.

Crypto Period
This is the suggested crypto period. The actual crypto period is negotiated at the connection to an ECMG.

Transport Stream ID
This must match a TSID of the interface where the VC's referencing the SCG are attached

New (button)
Click this button to create a new Scrambling Control Group entry.

Delete (button)
Highlight and entry and click this button to delete and existing Scrambling Control Group entry.

Related Topics

"How to Configure the NetVX to Use Conditional Access" on page 116.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG > ECM Dialog" on page 226.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System Dialog" on page 227.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > ECMG Dialog" on page 228.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > EMMG Dialog" on page 228.
"Config > Scramblers > SCR Properties Dialog" on page 373.

7.10.2 Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG > ECM Dialog

Abstract: *Use this dialog to configure an Entitlement Control Message service and to associate it with a Scrambling Control Group (SCG).*

CA SCG ECM Control

SCG Entries
Use this drop down to select the Scrambling Control Group (SCG) with which this

PID
PID to use for ECM. Must be unique across all PIDs in multiplex.

Service ID
The assigned service ID. This value is typically is the program number in the transport multiplex.

System Index
This is the index of the CAS entry that is associated with the ECM. Used to find an appropriate ECMG to attach the ECM to.

New (button)
Click this button to create a new Entitlement Control Message service entry.

Delete (button)
Highlight and entry and click this button to delete an existing Entitlement Control Message service.

Related Topics

"How to Configure the NetVX to Use Conditional Access" on page 116.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG Dialog" on page 225.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System Dialog" on page 227.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > ECMG Dialog" on page 228.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > EMMG Dialog" on page 228.
"Config > Scramblers > SCR Properties Dialog" on page 373.

7.10.3 Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System Dialog

Abstract: *This dialog provides controls for establishing connections to Entitlement Control Message Generators (ECMG).*

System Control

Entries
Each entry in this list represents a Conditional Access System.

Tag
Use this field to create name the Conditional Access system.

System ID
Use this field to specify the Conditional Access System ID of the Conditional Access System.

New (button)
Click this button to create a new Entitlement Control Message service entry.

Delete (button)
Highlight and entry and click this button to delete an existing Entitlement Control Message service.

Related Topics

"How to Configure the NetVX to Use Conditional Access" on page 116.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG Dialog" on page 225.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG > ECM Dialog" on page 226.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > ECMG Dialog" on page 228.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > EMMG Dialog" on page 228.
"Config > Scramblers > SCR Properties Dialog" on page 373.

7.10.4 Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > Access Criteria Dialog

Abstract: *This dialog provides controls for managing Access Criteria.*

System
Use this drop-down to select the desired Conditional Access System.

Access Criteria (Entries List)
Each entry represents defined access criteria. Controls in this dialog provide settings for connecting to each set of criteria.

Tag
(Optional) Name for the access criteria on the conditional access system.

Value
(Optional) This parameter provides a method to set the access criteria specific to a conditional access system.

7.10.5 Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > ECMG Dialog

Abstract: *This dialog provides controls for establishing connections to Entitlement Control Message Generators (ECMG).*

CA System ECM Generator Control

System
Use this drop-down to select the desired Conditional Access System.

ECM Generators (Entries List)
Each entry represents and ECM generator. Controls in this dialog provide settings for connecting to each ECMG.

Tag
(Optional) Name for the ECMG on the Conditional Access System.

Sub CA System ID
Must be unique for each ECMG on the Conditional Access System.

Transport Stream ID
Must be unique for each multiplexed transport on NetVX using Simulcrypt controlled program VC. This is the ID of the transport interface where the ECM generated by the ECMG will be played out.

IP Address
The IP address on CAS of the ECMG.

Port
The IP port for the ECMG on CAS.

New (button)
Click this button to create a new ECMG entry.

Delete (button)
Highlight and entry and click this button to delete and existing ECMG entry.

Related Topics

"How to Configure the NetVX to Use Conditional Access" on page 116.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG Dialog" on page 225.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG > ECM Dialog" on page 226.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System Dialog" on page 227.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > EMMG Dialog" on page 228.
"Config > Scramblers > SCR Properties Dialog" on page 373.

7.10.6 Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > EMMG Dialog

Abstract: *This dialog provides controls for establishing connections to Entitlement Management Message Generators (EMMG).*

CA System EMM Generator Control

System
Use this drop-down to select the desired Conditional Access System.

EMM Generators (Entries)

Each entry represents and EMM generator. Controls in this dialog provide settings for connecting to each EMMG.

Tag

Optional name for EMMG on Conditional Access System.

Transport Stream ID

Must be unique for each multiplexed transport on NetVX using Simulcrypt controlled program VC. This is the ID of the transport interface where the EMMs generated by the EMMG will be played out.

EMM Data Rate (Kbps)

This is the maximum bandwidth to be consumed by EMMs on the transport. This bandwidth must be taken into account when allocating rate on programs and other data on the interface.

EMM (IP) Protocol

Connections are always TCP but data transfer can be TCP or UDP. Must be configured the same on Conditional Access System.

IP Address

IP address of CAS that will connect to the TCP port.

TCP Port

TCP port to use for the EMMG server.

UDP Port

TCP port to use for the EMMG server.

New (button)

Click this button to create a new EMMG entry.

Delete (button)

Highlight and entry and click this button to delete and existing EMMG entry.

Related Topics

"How to Configure the NetVX to Use Conditional Access" on page 116.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG Dialog" on page 225.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG > ECM Dialog" on page 226.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System Dialog" on page 227.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > ECMG Dialog" on page 228.
"Config > Scramblers > SCR Properties Dialog" on page 373.

7.11 Config > System > CA Systems Branch

Click this branch to see a table listing each CA system associated with the NetVX.
Double-click any white cell in the table to open the 'CA System' dialog.

7.11.1 Config > System > CA Systems > CA System # > ECM Generators > CA System Tab

Use this dialog to create an entry for each CA system that may be associated with this NetVX.

Entries
(Optional) Name for the Conditional Access System.

System ID
The conditional Access System ID of the Conditional Access System.

7.11.2 Config > System > CA Systems > CA System # > ECM Generators > ECMG Tab

Tag
(Optional) Name for the ECMG on the Conditional Access System.

State
Indicates whether or not this entry is active.

Transport Stream ID
Must be unique for each multiplexed transport on NetVX using Simulcrypt controlled program VC. This is the ID of the transport interface where the ECM generated by the ECMG will be played out.

Sub CA System ID
Must be unique for each ECMG on the Conditional Access System.

IP Address
The IP address on CAS of the ECMG.

Port
The IP port for the ECMG on CAS.

7.11.3 Config > System > CA Systems > CA System # > ECM Generators > EMMG Tab

Tag
Optional name for EMMG on CAS.

State
Current connection state to the ECMG.

Transport Stream ID
Must be unique for each multiplexed transport on NetVX using Simulcrypt controlled program VC. This is the ID of the transport interface where the EMMs generated by the EMMG will be played out.

EMM Data Rate (Kbps)
This is the maximum bandwidth to be consumed by EMMs on the transport. This bandwidth must be taken into account when allocating rate on programs and other data on the interface.

IP Protocol

TCP or TCP/UDP Connections are always TCP but data transfer can be TCP or UDP. Must be configured the same on CAS.

IP Address

IP address of CAS that will connect to the TCP port.

TCP Port

TCP port to use for the EMMG server.

UDP Port

TCP port to use for the EMMG server.

7.12 System Status Branch

Click a tab on the right side of the screen to view groups of status parameters for this system. With any tab selected, press F1 for help on items in that group.

7.12.1 Status > System > General Tab

Abstract: *Items in this table provide basic system identification and status.*

UTC Time

This field indicates the current Universal Time (UTC), also known as GMT.

UTC Date

This field displays the current date in UTC time.

Link Status

Indicates the rate at which the active System Controller's Ethernet interface is operating.

Model

This portion of the table indicates the chassis's serial number, feature string, MAC address, and the date the chassis was manufactured. In the event you call technical support, you may be asked to provide this information.

Firmware Version

This portion of the table provides details about the firmware release that is currently the active release.

Reference Source

Indicates the condition of the reference signal source. Given a composite reference signal (sometimes called 'black burst'), decoders and other equipment can lock their picture generation to the reference input. By synchronizing equipment to the same signal, a studio enables frame-accurate operations and avoids glitches in the broadcast signal.

This status value reflects both the configuration of the reference source and the condition of the input signal. When configured for an external signal, the supplied signal must match the expected frame rate to let the system synchronize its clock.

Ext-ntsc, Ext-pal	When the system is configured to receive an external reference signal, and the system successfully locks its clock to that signal, the status reflects the configured input. See the 'None' and 'NotLocked' options below for further information.
Int-ntsc, Int-pal	When the system is configured to use an internal reference clock, the status reflects the configured input.
None	This status value occurs when an external signal is configured, but no signal is present on the reference input.
NotLocked	This status value occurs when an external signal is configured, a signal is detected on the reference input, but the system cannot lock to the signal's frame rate.

Evaluation Time

Indicates the amount of time remaining on the system evaluation key. Evaluation keys allow unrestricted use of otherwise software-keyed system features.

Front Panel LEDs

This portion of the table indicates the state of the system's front panel LEDs. Items A-D, in the topic "Overview of the NetVX Status Display in Vidiem" on page 190 define the meanings of the state of each of these LED's.

7.12.2 Status > System > GPI Tab

This table displays a summary of the state of all GPI relays.

7.12.3 Status > System > GPO Tab

This table displays a summary of the state of all GPO relays.

Each relay's fault state is also listed. A fault indicates that the NetVX has detected that a GPO relay is not in the state expected based on software configuration.

7.12.4 Status > System > Mechanical Tab

This tab summarizes fault states of various NetVX sub-systems and components.

General

Front Panel Display

Indicates the state of the front panel controller. If this fault is indicated, check the wiring between the system controller and the connector board. Correct wiring is illustrated in the chapter on the VR-1700 Chassis in the 'NetVX Video Networking System Reference Manual'.

Fan 1 Fault, Fan 2 Fault

Indicates the state of the NetVX's fans. Fan 1 represents the fan on the right when looking at the system from the rear. Fan 2 represents the fan on the left. Fault indicates that one of the system's fans has failed.

Temperature (Celsius)

This row indicates the NetVX's internal temperature. A trap issued if the temperature reaches 70 degrees Celsius.

Power

Power Supply # Present

Indicates the power supply slot(s) in which a power supply module is located.

Power Supply # Fault

Indicates the power supply slot(s) in which a fault condition is present.

+3V, +5V, +12V, -12V Power Faults

Indicates 'fault' for the respective power supply voltage line. Faults on any of these lines typically indicate that a power supply is faulty and should be replaced.

7.12.5 Status > System > Serial Tab

This tab provides status of the system serial ports.

Mode

Indicates the mode of operation (RS-422, or RS-232) that each of the NetVX's serial ports is set to operate in. The mode is manually controlled by the switch that is adjacent the serial port connector on the rear of the system.

Received Characters

Maintains a count of characters received by this serial port from external equipment. Use this parameter to verify that the interface is receiving characters from an external piece of equipment.

Received IP Characters

Maintains a count of characters received by this serial port from external equipment and transmitted using UDP or Telnet. This value will always be equal to or less than 'Received Characters'.

Use this command in conjunction with 'Received Characters' to verify that all characters received by the serial interface are being transmitted via either the UDP or telnet interface.

State

Indicates the functional state of the serial port. This value depends on the port's configured function and tells what the application is doing.

active	The function is active. This value applies to all functions except telnet.
connected	This function applies to the telnet function and indicates a session is in progress.
waiting	This function applies to the telnet function and indicates the listener is waiting for a connection to be established. No telnet session currently exists. This value indicates the state of the application, but it does not give information about character input or output. The state could be active with no characters being transmitted or received.

Transmitted Characters

Maintains a count of characters transmitted from this serial port to external equipment.
This value will always be equal to or less than 'Transmitted IP Characters'.

Transmitted IP Characters

Maintains a count of characters received over UDP or Telnet and transmitted from this serial port to external equipment.

7.12.6 Status > System > CA SCG

Tag

The user-defined name for this Scrambling Control Group.

Crypto Period

This is the suggested crypto period. The actual crypto period is negotiated at the connection to an ECMG.

Transport Stream ID

This must match a TSID of the interface where the VC's referencing the SCG are attached

7.12.7 Status > System > ECM

System

Index of configured system associated with SCG ECM

ECMG

Index of the configured ECMG to which this ECM is attached.

Packets

Count of the number of ECm packets received.

7.12.8 Status > System > CA System

Tag

Tag (name) defined for this CA system.

7.12.9 Status > System > ECMG

Tag

Configured name for this ECMG.

State
Current state of the connection to the ECMG.

Transport Stream ID
Indicates the transport stream ID configured for the ECMG.

7.12.10 Status > System > EMMG

Tag
Name defined for this EMMG.

State
Current state of the connection to the ECMG.

Transport Stream ID
Transport Stream ID for this EMMG.

Bandwidth
Actual negotiated bandwidth. May or may not be the same as configuration.

Packets
Number of packets received from the EMMG.

7.13 Alarms Status Branch

Click a tab on the right side of the screen to view groups of alarm status parameters. With any tab selected, press F1 for help on items in that group.

7.13.1 Status > Alarms > Current Tab

This tab provides a list of current alarm conditions. The NetVX promotes alarms with the highest severity to the top of the list.

7.13.2 Status > Alarms > History Tab

This table lists each type of alarm and indicates if the alarm has been triggered since the last time the system was powered, or reset, or its alarm history was cleared.

- "Overview of NetVX Alarms" on page 214.
- "Config > System > General Alarms Dialog" on page 215.

Chapter 8: NetVX Modules Branch 8

8.1 Module Configuration Tables and Dialogs

8.1.1 Config > Modules Table

Abstract: *This table displays a column for every slot in the system. Columns in this table indicate the module type configured for each slot. The module state row indicates if the module is configured for active service.*

Note: You can configure a slot to receive a specific type of module before actually installing the module. If, however, the slot is configured for active operation, errors and alarms will result.

Module Type

Indicates the Base Type of module hardware installed in each slot.

Detected Module Type

Indicates the full Module Type as defined according to available, keyed features. See the "System and Module Types and Keyed Features" on page 472 for information on the capabilities of each module.

ATM, IP, Mux Dx, Mux Mx, Reserved Max.

The values are set by the Vidiem Service Manager.

When value pairs (min. and max.) are specified in these fields, they represent ranges defined exclusively for use by the Vidiem Service Manager. Vidiem will yield to these ranges when allocating VCs and will not write to VCs whose indices fall within them.

State

Indicates the current configured state of the module.

Configuration Tag

Indicates the name of the Module Configuration (also called 'Profile') currently applied to module in the respective slot.

Protection Mode

Indicates the protection mode in which the module is running.

Router Serial Port

Indicates the NetVX serial port used to communicate with the backup router.

Note: See the help on the "Config > Module Properties Dialog" on page 238 for more details on each of the functions listed above.

Failed Slot

Indicates the slot to which this modules service will move in the event of a module failure.

0 Indicates no other module is configured to operate as a back up for this module.

8.1.2 Config > Module Properties Dialog

Use these controls to configure module operations.

Note: The phrase 'selected slot' is used in the following descriptions to refer to the module that is highlighted in the list of modules appearing on the left side of this dialog.

Control

Module Type

Use this control to specify the type of module the system should expect to find in the selected slot. The system will issue an alarm if there is a mismatch between the specified and the installed module types. See the "System and Module Types and Keyed Features" on page 472 for information on the capabilities of each module.

Enable for Operation

Check this box to enable the module in the selected slot. The system will issue an alarm if a module is enabled but not physically present in the slot.

Note: See "Overview of NetVX Alarms" on page 214 for more details.

Configuration Tag

Use this control to specify a name for this configuration (also called a 'Profile'). The Profile is named here and saved using the "Config > Utilities > Profile Dialog" on page 467'.

Router Serial Port

Identifies the auxiliary serial port that the module in the selected slot should use to issue router commands when operating protection mode.

0 - None	This backup module does not use a serial port to communicate with a router in the event of a failover of a failback.
1	This backup module use the NetVX's 'Serial Port 1" to convey failover and failback control signals.
2	This backup module use the NetVX's 'Serial Port 2" to convey failover and failback control signals.

Protection

Use the controls in this section to designate main and protection (backup) modules.

Use as Main (radio button)

Choose this option to cause the module in the selected slot to operate as a main module.

Use as Internal Backup (radio button)

Choose this option to use this module as a backup for other modules in the same chassis.

Use as External Backup (radio button)

Choose this option to use this module as a backup for other modules in the other chassis.

Protection Module

Use this control to identify the slot containing a backup module for the module in the selected slot.

- This option is only available if 'Use as Main' option (above) is selected.
- Selection options are limited to (a) Slots containing modules of the same type as the module in the selected slot and (b) Modules configured to 'Use as Backup' (described below).

Use as Backup (radio button)

Choose this option to cause the module in the selected slot to operate as a backup module.

Note: See "How to Configure a Backup Module" on page 434 for the details on using these controls.

Related Procedures

"General Module Redundancy Procedures" on page 431
"How to Configure a Main Module" on page 432
"How to Configure a Backup Module" on page 434
"Config > Utilities > Protection Modules Dialog" on page 468

8.2 Module Status

8.2.1 Status > Modules Table

This table provides a status summary of every slot in the system.

Configured Module Type (row)

Indicates the type of module the slot is configured to receive.

Detected Module Type

Indicates the type of module actually installed in the slot. The NetVX initiates a 'Module Degrade - Module Wrong Type' alarm if there is a mismatch between the Configured Module Type and the Detected Module Type and the installed module is made active.

Serial Number

Indicates the serial number for each module.

Features

Indicates any keyed features that are enabled on this module. See "System and Module Types and Keyed Features" on page 472 for details.

Status

Protection Mode

Indicates whether or not a backup module is configured to protect the respective slot.

Protection Availability

Indicates the availability of the protection module assigned to this slot.

Unneeded Indicates that this slot does not have an assigned protection module.

Available Indicates the protection module for this slot is available.

Unavailable Indicates that the protection module assigned to this slot is unavailable an the slot is therefore unprotected.

A slot may indicate 'Unavailable' for any of the following reasons.

- The protection module for this slot is covering for another failed module.
- The protection module itself may have failed or may be experiencing either a degrade condition or a fault condition.
- The protection module may have been removed from the system.
- The protection module may not be the right module type to protect this module.

Failed Slot

Indicates if the module in this slot has taken over service for another module.

0	This value indicates the module in this slot is not configured as a backup.
1 to (max. # of slots)	Any value in this range indicates the slot from which this module has assumed service as the result of a failover.

Last Fault

This field indicates the last fault (or debugging message) that the module in this slot has reported.

Software Fault

A 'Fault' entry indicates the module is experiencing a serious software fault. This fault condition is very rare and may be the result of an incomplete software upgrade.

LED-1

This row represents the state of the Module Fault LED. This LED is present on every NetVX module except the SYS-G10.

OFF	Indicates the module is not powered.
Green	Indicates the module is active but no faults are detected.
Amber	Indicates the module is offline, booting, or running diagnostics.

LED-2 through LED-5

These LEDs are described in detail for each module in the topic "Module Status Images" on page 193.

Chapter 9: NetVX Encoder Module

Configuration and Status Dialogs

9

9.1 Encoder Configuration

9.1.1 Config > Encoders Table

Abstract: *The 'Encoders' branch of the navigation tree contains a sub-branch for each encoder module.*

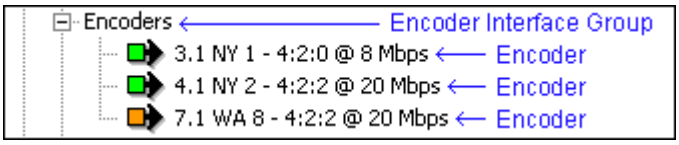


Figure 9-1 The Encoders Branch of Vidiem™'s Navigation Tree

Each encoder operates directly as cross connection source. Therefore, unlike ATM and IP modules, you do not need to create a VC on an encoder to cross connect its signal to another module. See Section 3 "NetVX Configuration Procedures" on page 146 for details on how to connect an encoder's signal to other modules.

For details about the colored icons shown in the navigation tree above, see the topic "Overview of Navigation Tree Icons" on page 180.

Encoders Branch

The table on the right side of the screen provides a high-level summary of settings for each encoder installed in the system.

Tag

Displays the tag assigned to each encoder.

Program Name

Indicates the MPEG program name.

Transport Stream Rate (Mbps)

Indicates this encoder's total transport stream bit rate.

Input

Indicates the input source for encoder.

Active Audio Pairs

Indicates the number of active audio pairs for each program.

Encryption Mode

Indicates the mode of encryption configured for the encoder in this column.

BISS SW

Indicates the encoder's current BISS Session Word. This field is blank if the encoder Session Word has not been set.

9.2 Encoding Branch

Click a tab on the right side of the screen to view groups of configuration parameters for this encoding channel. With any tab selected, press F1 for help on items in that group.

Double click any table cell, in any tab, to open the related configuration dialog.

9.2.1 Config > Encoder > Program Tab

This table provides a summary of the selected encoder's program settings.
Double click any row to open a program dialog and change settings.

Tag

Displays the tag assigned to each encoder.

Closed Caption Source

Indicates the configured closed caption source.

Program Name

Indicates the MPEG program name.

No Input

Indicates the behavior that the encoder will exhibit in the event of a loss of input signal.

TS Rate (Mbps)

Indicates this encoder's total transport stream bit rate. Sub-entries for Video TS, PSI, PCR, PIP, Audio, Data, VANC, VBI, Safety Factor, Frame Completion detail specific components comprising this overall rate.

Program SI-PSI Mode

Indicates the selected System Information/Program Specific Information mode.

Network ID

Indicates the DVB network identifier configured for this program.

PCR Location

Indicates if the program's is configured to put its PCRs on a 'separate' PID, or if PCRs are 'combined' with the video stream.

Splice Preroll

Indicates the specified delay between a splice point trigger and its insertion.

Splice Trigger

Indicates the GPI configured to be the splice point insertion trigger for this encoder.

Data Services

VANC Degrade

Indicates the state of VANC degrade alarm notification.

VBI Degrade

Indicates the state of VBI degrade alarm notification.

DID Filter
Indicates if VANC service filtering by DID/SDID is enabled.

VANC Data Rate (kbps)
Indicates the VANC data rate.

Teletext Mode
Indicates the encoder's configured Teletext mode.

Encryption Mode

BISS SW (Session Word)
Indicates the BISS Session Word specified for this program.

Splice Trigger

Indicates the GPI currently configured to operate as the Splice Trigger input.
If this value is blank, then a GPI has not been specified as the splice trigger input for this encoder.

9.2.2 Config > Encoder > Video Tab

This table provides a summary of the selected encoder's video settings. Double click any row to open an video dialog and change settings.

State

Indicates if the encoder is enabled or disabled.

Input

Indicates the encoder's input source.

Film Detection

Indicates whether or not the encoder is operating in film detect mode.

Resolution

Indicates the encoder's resolution and chroma format settings.

Minimum Quant.

Displays the minimum quantization setting.

Vertical Offset

Specifies the number of lines to shift the first line of encoded video. The remaining lines are subsequently offset by this amount as well. See Table 9-6, "Input Resolution, Possible Frame Rate Settings, Standards, and Coded Lines Per Field" on page 266 for possible settings and their implications.

Note: This setting does not affect VBI line settings or the overall number of lines received by decoders.

-2	Encoded video begins on line 24. This setting makes the decoded image on a monitor shift up two lines from the default.
-1	Encoded video begins on line 23. This setting makes the decoded image on a monitor shift up one line from the default.
0	Encoded video begins on line 22. This setting is the default.
1	Encoded video begins on line 21. This setting makes the decoded image on a monitor shift down one line from the default.
2	Encoded video begins on line 20. This setting makes the decoded image on a monitor shift down two lines from the default.

Video Rate (Mbps)

Indicates the computed video bitrate. This rate is calculated by starting with the total transport stream bitrate and deducting the rates used by audio, closed captions, VBI line data, VANC data, and other overhead. See Section 17.4, "Overview of the Program Transport Stream Rate" on page 516 for details on how this rate is calculated.

Pre-Processing

Indicates the video pre-processor setting.

Control

Video Degrade

Indicates the state of Video Degrade alarm notification for this encoder. See "Video Degrade Alarms" on page 509 for details.

Video Fault

Indicates the state of Video Fault alarm notification for this encoder. See "Video Fault Alarm" on page 510 for details.

Router Level (column)

Indicates the router level assigned to the video signal feeding this encoder.

Router Input Port (column)
Indicates the router (input) port receiving its signal directly from the video/audio source.

Router Output Port
Indicates the router (output) port connected directly to module's input jack.

Picture

Aspect Ratio
Indicates the current aspect ratio setting.

GOP Structure
Indicates the current GOP structure settings.

GOP Size
Indicates the GOP size setting.

9.2.3 Config > Encoder > Audio Tab

Abstract: *This table lists current audio settings for both the primary and secondary audio channels.*

Double click any row to open an audio dialog and change settings.

State
Indicates if the audio encoder is enabled.

Standard (audio)
Indicates the audio encoding standard.

MPEG	Use these selections for MPEG Layer 1 encoding. See Section 9.2.3.4, "MPEG Audio "Standard" and "Mode" Settings" on page 253 for details.
AC-3	Use these selections for Dolby AC-3 encoding. See Section 9.2.3.2, "AC-3 Audio "Standard" and "Mode" Settings" on page 251 for details.
AAC-HE	Use this selection for AAC High-Efficiency encoding. This option is only available on MPEG-4/H.264 encoders. See Section 9.2.3.1, "AAC-HE, AAC-LC Audio "Standard" and "Mode" Settings" on page 248 for details.
AAC-LC	Use this option for AAC Low-Complexity encoding. This option is only available on MPEG-4/H.264 encoders. See Section 9.2.3.1, "AAC-HE, AAC-LC Audio "Standard" and "Mode" Settings" on page 248 for details.
External Compression	Use these selections when using an external audio encoder. See Section 9.2.3.3, "Externally-Compressed Audio Settings" on page 252 for details.
SMPTE-302M	Use this selection when using uncompressed AES3 according to SMPTE 302. See Section 9.2.3.5, "SMPTE 302 Audio Settings" on page 254 for details.

Bitrate

Use this control to specify the audio bit rate.

Note: Options available to this control are governed by the audio 'Standard' setting described above. Only rates that are compatible with the selected standard are presented.

- Section 9.2.3.1, "AAC-HE, AAC-LC Audio "Standard" and "Mode" Settings" on page 248
- Section 9.2.3.2, "AC-3 Audio "Standard" and "Mode" Settings" on page 251
- Section 9.2.3.3, "Externally-Compressed Audio Settings" on page 252
- Section 9.2.3.4, "MPEG Audio "Standard" and "Mode" Settings" on page 253
- Section 9.2.3.5, "SMPTE 302 Audio Settings" on page 254

Delay (ms)

Indicates the setting of the amount of audio delay (in milliseconds) that the encoder should apply to this audio signal relative to video.

Gain (dB)

Indicates the amount of gain that the encoder is applying to the audio input prior to encoding.

Analog Input Level

Indicates the configured nominal analog input level.

Note: Options available to this control are governed by the SI/PSI mode setting. See "SI/PSI Mode Table Transmission Rates and Other Parameter Constraints" on page 259

Audio Coding Mode

Indicates how the encoder is configured to treat the audio input options.

Input

Indicates the source of the audio input.

Embed Group

Identifies embedded audio group used if the audio input above is set to 'embedded'. This setting is displayed whether embedded audio input is used or not.

Channel

Identifies embedded audio channel used if the audio input above is set to 'embedded'. This setting is displayed whether embedded audio input is used or not.

Control

Audio Degrade

Indicates if audio degrade alarm reporting is enabled.

Audio Fault

Indicates if audio fault alarm reporting is enabled.

Router Level

Indicates the configured router level for the respective audio signal.

Router Input Port

Indicates the configured router input port for the respective audio signal.

Router Output Port
Indicates the configured router output port for the respective audio signal.

Bitstream

Copyright, Digital De-emphasis, Original
Indicates the audio encoder's settings for each of these flags in the audio bitstream.

ISO Language Code
This control specifies the ISO language code identifying the audio stream.
In dual-mono mode, this control specifies the ISO language code used for the first mono audio channel.
This control also accepts text input, so any other ISO-639-2-compliant country code may be entered as well.

ISO Language Code 2
In dual-mono mode, this control specifies the ISO language code used for the first mono audio channel.
This control also accepts text input, so any other ISO-639-2-compliant country code may be entered as well.

Production Information Exists

Indicates if production information exists for the audio stream.

Mix Level (dB SPL)
Indicates the mix level setting.

Room Type
Indicates the room type setting.

Service

Indicates the audio service type setting.

Dialog Normalization
Indicates the dialog normalization setting of the audio channel.

9.2.3.1 AAC-HE, AAC-LC Audio "Standard" and "Mode" Settings

This section details the range of audio settings provided for use with modules supporting AAC audio encoding.

The quality vs. bit rate relationship between the various AAC audio coding selections can be seen in the Figure 9-2 below.

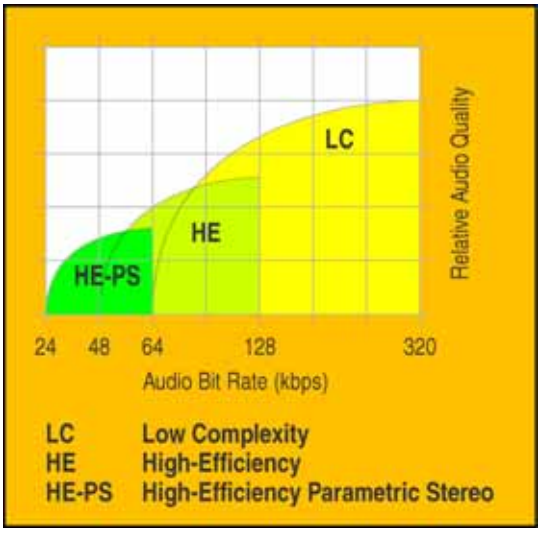


Figure 9-2 Relative Audio Bitrate and Quality Amongst AAC Audio Choices

About Table 9-1 below …

- The ‘Audio Standard’ is configured using the Standard (audio) control.
- The ‘Audio Mode’ is configured using the Audio Coding Mode control.
- The nominal ‘Bitrate’ is configured using the Bitrate control.

Table 9-1 HE-AAC, AAC-LC Audio “Standard” and Audio “Mode” Settings and Bitrates

Possible Audio “Standard” Settings	Possible Audio “Mode” Settings *					Nominal Bit Rate (bps)	Transport Stream Bit Rate (bps) (Includes TS Overhead)	Support by Module					
	Mono	Dual-Mono	Stereo	Parametric Stereo	5.1			ENC-H11	ENC-S21	ENC-S11	ENC-A11	* ENC-A21	AUD-D14
aac-he-24k	●	❍	❍	●	❍	24000	29375	❍	❍	❍	●	●	❍
aac-he-32k	●	❍	❍	●	❍	32000	35250	❍	❍	❍	●	●	❍
aac-he-40k	●	❍	❍	●	❍	40000	41125	❍	❍	❍	●	●	❍
aac-he-48k	●	❍	●	●	❍	48000	52875	❍	❍	❍	●	●	❍
aac-he-56k	●	❍	●	●	❍	56000	60160	❍	❍	❍	●	●	❍
aac-lc-56k	●	●	●	❍	❍	56000	60160	❍	❍	❍	●	●	❍
aac-he-64k	●	❍	●	●	❍	64000	66176	❍	❍	❍	●	●	❍
aac-lc-64k	●	●	●	❍	❍	64000	66176	❍	❍	❍	●	●	❍
aac-he-80k	❍	❍	●	❍	❍	80000	84224	❍	❍	❍	●	●	❍
aac-lc-80k	●	●	●	❍	❍	80000	84224	❍	❍	❍	●	●	❍
aac-he-96k	❍	❍	●	❍	❍	96000	102272	❍	❍	❍	●	●	❍
aac-lc-96k	●	●	●	❍	❍	96000	102272	❍	❍	❍	●	●	❍
aac-he-112k	❍	❍	●	❍	❍	112000	120320	❍	❍	❍	●	●	❍
aac-lc-112k	●	●	●	❍	❍	112000	120320	❍	❍	❍	●	●	❍
aac-he-128k	❍	❍	●	❍	❍	128000	132352	❍	❍	❍	●	●	❍
aac-lc-128k	●	●	●	❍	❍	128000	132352	❍	❍	❍	●	●	❍
aac-he-160k	❍	❍	❍	❍	●	160000	164500	❍	❍	❍	❍	●	❍
aac-lc-160k	●	●	●	❍	❍	160000	168448	❍	❍	❍	●	●	❍
aac-he-192k	❍	❍	❍	❍	●	192000	199750	❍	❍	❍	❍	●	❍
aac-lc-192k	❍	●	●	❍	❍	192000	198528	❍	❍	❍	●	●	❍
aac-he-224k	❍	❍	❍	❍	●	224000	23500	❍	❍	❍	❍	●	❍
aac-lc-224k	❍	●	●	❍	❍	224000	234624	❍	❍	❍	●	●	❍
aac-he-240k	❍	❍	❍	❍	●	240000	246750	❍	❍	❍	❍	●	❍
aac-lc-256k	❍	●	●	❍	❍	256000	264704	❍	❍	❍	●	●	❍
aac-lc-280k	❍	❍	❍	❍	●	280000	287875	❍	❍	❍	❍	●	❍
aac-lc-320k	❍	●	●	❍	❍	320000	330880	❍	❍	❍	●	●	❍
aac-lc-384k	❍	❍	❍	❍	●	384000	393625	❍	❍	❍	❍	●	❍
aac-lc-448k	❍	❍	❍	❍	●	448000	458250	❍	❍	❍	❍	●	❍
aac-lc-512k	❍	❍	❍	❍	●	512000	528750	❍	❍	❍	❍	●	❍
aac-lc-576k	❍	❍	❍	❍	●	576000	593375	❍	❍	❍	❍	●	❍
aac-lc-640k	❍	❍	❍	❍	●	640000	658000	❍	❍	❍	❍	●	❍
aac-lc-800k	❍	❍	❍	❍	●	800000	822500	❍	❍	❍	❍	●	❍

Legend	
Supported Feature	●
Unsupported Feature	❍

* The ENC-A21 can process up to three channels of AAC audio.

Note: HE-AAC indicates that Spectral Band Replication is being used.

* HE-AAC Version 1 is used when the audio ‘Standard’ is set to ‘AAC-HE-*’ and any of the ‘Modes’ Mono, Dual-Mono, and Stereo.
* HE-AAC Version 2 is used when the audio ‘Standard’ is set to ‘AAC-HE-*’ and the ‘Mode’ is set to ‘Parametric Stereo’.

9.2.3.2 AC-3 Audio "Standard" and "Mode" Settings

This section details the range of audio settings provided for use with modules supporting AC-3 audio encoding.

- The 'Audio Standard' is configured using the Standard (audio) control.
- The 'Audio Mode' is configured using the Audio Coding Mode control.
- The nominal 'Bitrate' is configured using the Bitrate control.

Table 9-2 AC-3 Audio "Standard" and Audio "Mode" Relationships and Bitrates

Possible Audio "Standard" Settings	Possible Audio "Mode" Settings		Nominal Bit Rate (bps)	Transport Stream Bit Rate (bps) (Includes TS Overhead)	Support by Module					
	Mono	Stereo			ENC-H11	ENC-S21	ENC-S11	ENC-A11	ENC-A21*	AUD-D14
ac3-56k	●	❍	56000	58751	●	●	●	●	●	●
ac3-64k	●	❍	64000	67143	●	●	●	●	●	●
ac3-80k	●	❍	80000	82251	●	●	●	●	●	●
ac3-96k	●	●	96000	99223	●	●	●	●	●	●
ac3-112k	●	●	112000	114889	●	●	●	●	●	●
ac3-128k	●	●	128000	131601	●	●	●	●	●	●
ac3-160k	●	●	160000	164501	●	●	●	●	●	●
ac3-192k	●	●	192000	197401	●	●	●	●	●	●
ac3-224k	●	●	224000	229778	●	●	●	●	●	●
ac3-256k	●	●	256000	263201	●	●	●	●	●	●
ac3-320k	●	●	320000	329001	●	●	●	●	●	●
ac3-384k	●	●	384000	393626	●	●	●	●	●	●
ac3-448k	●	●	448000	458251	●	●	●	●	●	●
ac3-512k	●	●	512000	523715	●	●	●	●	●	●
ac3-576k	●	●	576000	590112	●	●	●	●	●	●
ac3-640k	●	●	640000	658001	●	●	●	●	●	●

Legend	
Supported Feature	●
Unsupported Feature	❍

* The ENC-A21 can process up to three channels of AC-3 audio.

9.2.3.3 Externally-Compressed Audio Settings

This section details the range of audio settings provided for use with external audio encoders.

- The 'Audio Standard' is configured using the Standard (audio) control.
- The 'Audio Mode' is ignored for these standard settings.
- The nominal 'Bitrate' is configured using the Bitrate control.

Table 9-3 Externally-Compressed Audio "Standard" and Audio "Mode" Relationships and Bitrates

Possible Audio "Standard" Settings	Possible Audio "Mode" Settings	Nominal Bit Rate (bps)	Transport Stream Bit Rate (bps) (Includes TS Overhead)	Support by Module					
				ENC-H11	ENC-S21	ENC-S11	ENC-A11	ENC-A21	AUD-D14
extcomp-192k	N/A	192000	198445	●	●	●	●	●	●
extcomp-256k	N/A	256000	263201	●	●	●	●	●	●
extcomp-384k	N/A	384000	393626	●	●	●	●	●	●
extcomp-448k	N/A	448000	458251	●	●	●	●	●	●
extcomp-640k	N/A	640000	658001	●	●	●	●	●	●
extcomp-800k Use this setting for externally--compressed AAC 5.1.	N/A	800000	822500	❍	❍	❍	❍	●	❍
extcomp-2400k or Dolby-E Use this setting with external Dolby-E encoders	N/A	2400000	2419200	●	❍	●	●	❍	❍

Legend	
Supported Feature	●
Unsupported Feature	❍

9.2.3.4 MPEG Audio "Standard" and "Mode" Settings

This section details the range of audio settings provided for use with modules supporting MPEG audio encoding.

- The 'Audio Standard' is configured using the Standard (audio) control.
- The 'Audio Mode' is configured using the Audio Coding Mode control.
- The nominal 'Bitrate' is configured using the Bitrate control.

Table 9-4 MPEG Audio "Standard" and Audio "Mode" Relationships and Bitrates

Possible Audio "Standard" Settings	Possible Audio "Mode" Settings			Nominal Bit Rate (bps)	Transport Stream Bit Rate (bps) (Includes TS Overhead)	Support by Module					
	Mono	Dual-Mono	Stereo			ENC-H11	ENC-S21	ENC-S11	ENC-A11	ENC-A21	AUD-D14
mpeg-32k	●	❍	❍	32000	34182	●	●	●	●	●	●
mpeg-48k	●	❍	❍	48000	50134	●	●	●	●	●	●
mpeg-56k	●	❍	❍	56000	62667	●	●	●	●	●	●
mpeg-64k	●	❍	❍	64000	67889	●	●	●	●	●	●
mpeg-80k	●	❍	❍	80000	83556	●	●	●	●	●	●
mpeg-96k	●	●	●	96000	99223	●	●	●	●	●	●
mpeg-112k	●	●	●	112000	114889	●	●	●	●	●	●
mpeg-128k	●	●	●	128000	131601	●	●	●	●	●	●
mpeg-160k	●	●	●	160000	164501	●	●	●	●	●	●
mpeg-192k	●	●	●	192000	198445	●	●	●	●	●	●
mpeg-224k	❍	●	●	224000	229778	●	●	●	●	●	●
mpeg-256k	❍	●	●	256000	262061	●	●	●	●	●	●
mpeg-320k	❍	●	●	320000	329001	●	●	●	●	●	●
mpeg-384k	❍	●	●	384000	393091	●	●	●	●	●	●

Legend	
Supported Feature	●
Unsupported Feature	❍

* The ENC-A21 can process up to three channels of MPEG audio.

9.2.3.5 SMPTE 302 Audio Settings

This section details the range of audio settings provided for use with SMPTE-302-compliant audio input.

- The 'Audio Standard' is configured using the Standard (audio) control.
- The 'Audio Mode' is ignored for these standard settings.
- The nominal 'Bitrate' is configured using the Bitrate control.

Table 9-5 SMPTE 302 Sample Size, Bitrate, and Transport Stream Rate

Standard	Possible Audio "Mode" Settings	Sample Width	Nominal Bit Rate (bps)	Transport Stream Bit Rate (bps) (Includes TS Overhead)	Support by Module					
					ENC-H11	ENC-S21	ENC-S11	ENC-A11	ENC-A21	AUD-D14
smpte302-2000k	N/A	16 bits	1920000	2016000 bps	●	❍	●	●	●	●
smpte302-2400k	N/A	20 bits	2304000	2419200 bps	●	❍	●	●	●	●
smpte302-2800k	N/A	24 bits	2688000	2822400 bps	●	❍	●	●	●	●

Legend	
Supported Feature	●
Unsupported Feature	❍

9.2.4 Config > Encoder > Control Tab

Abstract: *This tab displays the current association status of the audio channel selected in the configuration tree.*

Function

Specifies the mode of operation for this auxiliary audio channel. The NetVX's database maintains encoder and decoder branches for each auxiliary audio channel. Parameters in both of these branches can be modified at any time regardless of the this parameter's setting.

off Disables this auxiliary audio channel for operation.

encode Enables this auxiliary audio codec to operate as an encoder.

decode Enables this auxiliary audio channel to operate as a decoder.

Association Mode

Indicates the mode of operation for the channel selected in the navigation tree.

associated This mode associates the auxiliary audio channel with another encoder or decoder (depending on the function). The associated slot identifies an encoder or decoder that 'inherits' the auxiliary facilities.

For example, suppose the function configures this auxiliary audio channel as an encoder, and the associated slot and channel are set to 5 and 1. Slot 5 should contain an encoder. This auxiliary processor's audio channel will augment the encoder's own audio set, with appropriate updates to the transport stream (the PMT, etc.).

standalone This mode directs this auxiliary audio channel to operate as an independent encoder or decoder (depending on the function). As an encoder, the channel generates a complete single program transport stream, carrying only audio. It may be cross-connected to any destination that consumes MPEG. Likewise, a decoder channel accepts a (single- or multi-program) transport stream as input, selects one audio stream from the designated program, and decodes that audio stream.

Associated Slot

This field indicates if the audio channel is associated with another module.

0 Indicates this audio channel is not associated with any slot.

Non-zero Indicates the slot with which this audio channel is associated.

9.2.5 Config > Encoder > Events Tab

This table represents the encoder's Event Table' and lists any 'current' or 'pending' events.

Double-click any row to edit its content in the 'Events Dialog'.

Encoder Events

This field indicates each encoder event.

Start Date

This field indicates the date the event is scheduled to start.

Start Time

This field indicates the time the event is scheduled to start.

Name

This field indicates the name of the event.

Description

This field provides a description of the event.

Related Dialog

See Section 9.3.12, "Config > Encoder > Events Dialog" on page 282

See Section 9.3.13, "Config > Encoder > Events > Event Content Dialog" on page 282

9.2.6 Config > Encoder > VANC Data Tab

This table provides a summary of vertical ancillary data (VANC) settings for each service.

Double click any row to open the Config > Encoder > VANC Data Dialog and change settings.

Related Dialog

See Section 9.3.14, "Config > Encoder > VANC Data Dialog" on page 283

9.2.7 Config > Encoder > VBI Lines Tab

This table provides a summary of VBI test pattern and function settings listed by field and line. Double click any row to open the VBI Lines dialog and change settings.

Related Dialog

Section 9.3.17, "Config > Encoder > VBI Lines Dialog" on page 288

9.2.8 Config > Encoder > VBI Teletext Tab

This table provides a summary of the teletext settings for each VBI line. Double-click any row in this table to open the VBI Teletext dialog and to change settings.

Related Dialog

Section 9.3.18, "Config > Encoder > VBI Teletext Dialog" on page 291

9.3 Encoder Dialogs

9.3.1 Config > Encoder > Program Dialog

Program

Tag

Use this field to name this encoding channel. The tag may be up to 31 characters long.

MPEG Name

Specifies the program name to send in the MPEG stream. The name may be up to 31 characters in long. Gives the program name to send in the MPEG stream. In all SI-PSI modes, the encoder uses this name for the component_name_descriptor in the program descriptor section of the PMT. When following the DVB paradigm, the encoder also uses the name for the SDT's service_descriptor.

No Input Behavior

Specifies how the encoder should respond to a loss of video input. In both of the following cases, the encoder generates a complete program map table (PMT).

Black The encoder continues generating elementary stream data for the lost signal. The encoder simulates black input for lost video and mute for lost audio. This setting effectively instruct the encoder to pretend that all inputs are present, supplying synthetic (black, mute) input as needed.

Stop This setting forcibly shuts down some or all of the transport stream, depending on the lost input.

The encoder stops generating MPEG packets on the PID of the lost input, but the PMT continues to carry the PID entry. If the stream is configured to put the PCRs in the video PID (see "PCR Location" on page 242), the encoder stops sending PCRs.

When the video input is lost, the encoder stops sending the PAT, PMT, and all program PIDs including audio, video, PCR, etc.

When the audio input is lost, but video remains present, the encoder continues sending the PAT, the PCR packets and the PMT (with all of its elements including video, audio, lost audio, PCR, etc.). The encoder stops sending packets for lost audio.

TS Rate

Use this control to specify the transport stream bitrate for this program in Mbps. This total includes bandwidth for all the program components: audio, video, VBI lines, and VANC data. All components except video have configured rates. The encoder subtracts those values from this total transport stream rate and assigns the remaining bandwidth to video. Please see Section 17.4, "Overview of the Program Transport Stream Rate" on page 516 and Section 17.3, "Range of NetVX Encoder Rates" on page 515.

Note: The 'Video Rate' must be more than half the 'Transport Stream Rate' otherwise errors will occur. Therefore ensure that this control (TS Rate) is configured to not more than twice the rate of the incoming video feed – or possibly even a bit less.

Video Rate (Mbps)

Indicates the computed video bitrate. This rate is calculated by starting with the total transport stream bitrate (or 'TS Rate' described above) and deducting the rates used by audio, closed captions, VBI line data, VANC data, and other overhead.

Use Separate PCR PID

The Program Clock Reference (PCR) is typically included within the video (or possibly the audio) elementary stream. Check this box to cause the encoder to put the PCR in a separate PID.

SI/PSI Mode

Specifies the SI-PSI mode for the MPEG transport stream. The selection chosen affects rates a which critical MPEG tables are transmitted and imposes constraints on other configuration parameters (see note below for details).

Note: This selection affects the rate at which critical MPEG tables are transmitted and imposes constraints on other configuration parameters. See "SI/PSI Mode Table Transmission Rates and Other Parameter Constraints" on page 259 for details about each of the following options.

ATSC	The stream uses ATSC conventions for over-the-air broadcast in the U.S. (HDTV or standard definition).
ATSC-Unchecked	Use the ATSC conventions, appropriate for digital on-air broadcast in the US (HDTV or digital standard definition). This value uses the ATSC conventions for SI and PSI, but it does not enforce the constraints on other parameters.
ISDB-Tb-Fixed	Use the ISDB-Tb (Integrated Services Digital Broadcasting, Terrestrial Brazil) conventions, appropriate for Brazil. This value specifically generates tables appropriate for the 'fixed' programs (intended for fixed-location decoders, such as residential televisions).
ISDB-Tb-Mobile	Use the ISDB-Tb (Integrated Services Digital Broadcasting, Terrestrial Brazil) conventions, appropriate for Brazil. This value specifically generates tables appropriate for the "mobile" programs (intended for mobile decoders, such as cell phones). This mode uses the program's event table to provide an electronic program guide.
DVB-Checked	The stream uses the DVB conventions, appropriate for Europe and some US cable companies.
DVB-Unchecked	Use the DVB conventions, appropriate for Europe and some US cable companies. This value uses the DVB conventions for SI and PSI, but it does not enforce the constraints on other parameters.
MPEG	The stream uses generic MPEG conventions.

Network ID

Specifies the DVB network identifier for this program. This 16-bit value identifies the network delivery system when the system information mode is set for DVB. Other SI modes ignore this value. See DVB A038 and ETSI ETR-162 for details.

Picture-In-Picture

This parameter controls the Picture-in-Picture (PIP) behavior. Enable this control only if the signal being generated is going into a Microsoft IPTV Head end

When PIP is enabled, the encoder generates a reduced-resolution video stream to accompany the main program. The addition of this secondary video causes the encoder to emit a multi-program transport stream: Program 1 carries the full resolution video, Program 2 carries the PIP video.

The PIP program carries two sub-streams: video and EIA-708-B closed captions. The PIP program does not include audio. The program consumes 200 Kbps of the transport stream's rate, which applies to the full MPTS. As a result, the PIP stream effectively reduces the rate available to the base program by 200 Kbps.

auto	Enables the PIP stream for this program. The encoder generates a two-program, multi-program transport stream.
off	Disables PIP for the program. No reduced resolution stream is generated for the base program. The encoder generates a single-program transport stream to carry the base program.

Country

Use this control to specify the three-character country code as described in ISO-3166. Codes for North and South America are provided in the drop down. This control also accepts text input, so any other ISO-3166-compliant country code may be entered as well.

9.3.2 SI/PSI Mode Table Transmission Rates and Other Parameter Constraints

The following table describes how the 'SI/PSI Mode' selection affects other parameters.

Table or Control	SIMODE Setting					
	ATSC-Checked	ATSC-Unchecked	ISDB-Tb	DVB-Checked	DVB-Unchecked	MPEG
PAT Transmission	Interval = 95 ms. Rate = 15832 bps		TBD	Interval = 395 ms. Rate = 3808 bps		Interval = 95 ms. Rate = 15832 bps
PMT Transmission Rate	Interval = 395 ms. Rate = 7616 bps		TBD	Interval = 395 ms. Rate = 3808 bps		Interval = 395 ms. Rate = 3808 bps

Table or Control	SIMODE Setting					
	ATSC-Checked	ATSC-Unchecked	ISDB-Tb	DVB-Checked	DVB-Unchecked	MPEG
SI Transmission Rate	Interval = (varied) Rate = 28092 bps.		TBD	Interval = (varied) Rate = 6032 bps.		Interval = 1000 Rate = 1504 bps.
Tables Transmitted	STT, MGT, TVCT, EIT-0, EIT-1, EIT-2, and EIT-3		TBD	TSDT, TDT, NIT, SDT, and EIT present/following		SDT
See the 'Indicate Deemphasis' control on page 278.	No constraints.	No constraints.	No constraints.	Only 'OFF'.	No constraints.	No constraints.
See the 'Audio Coding Mode' control on page 277.	No constraints.	No constraints.	No constraints.	Only 'DVB'.	No constraints.	No constraints.
See the 'Audio Coding Mode' control on page 277.	Not 'Dual-Mono'.	No constraints.	No constraints.	No constraints.	No constraints.	No constraints.
See the 'Standard' control on page 276.	Must be 'ac3-*' or 'extcomp-*' using 'AC-3' compression. One audio channel cannot exceed 448 Kbps. Sum of audio rates cannot exceed 576 Kbps.	No constraints.	No constraints.	Must be 'mpeg-*' or 'extcomp-*' using 'mpeg' compression. One audio channel cannot exceed 448 Kbps.	No constraints.	No constraints.
See the 'VANC Data Rate (kbps)' control on page 243.	SI tables are sent at ATSC intervals. The stat slot.s/ enc.m/vanc rate must not exceed 15 Mbps.	SI tables sent at ATSC intervals.	SI tables sent at generic MPEG intervals. See the TS Rate on page 257.	SI tables are sent at DVB intervals. The stat slot.s/ enc.m/vanc rate must not exceed 15 Mbps.	SI tables are sent at DVB intervals.	SI tables are sent at MPEG intervals.
See the 'Function' control on page 289.	Line 21 (fields 1 and 2) may be set to either 'none' or 'closedcaption'. All other line, in both fields must be set to 'none'.	No constraints.	No constraints.	No more than one line may be set to 'lossless'.	No constraints.	No constraints.
See the 'Video Input' control on page 292.	Only black-525, black-720-59, black-1080-29, comp-ntsc, sdi-525, sdi-720-59, sdi-1080-29.	No constraints.	No constraints.	No constraints.	No constraints.	No constraints.
See the 'Resolution' control on page 244.	Only std-640-420, std-704-420, std-1280-420, std-1920-420 are permitted.	No constraints.	No constraints.	Only cif-352-420, std-352-420, std-544-420, std-720-420, std-1280-420, std-1920-420.	No constraints.	No constraints.

9.3.3 Config > Encoder > Program > Scrambling Dialog

Scrambler

Encryption Mode

Use this control to specifies the encryption mode for this program. With encryption operating, an encoder can scramble its output and pass that stream over an insecure medium to an authorized decoder, which can unscramble the stream.

None Disables encryption. The encoder generates unscrambled output.

BISS Enables Basic Interoperable Scrambling System (BISS) encryption. This option directs the encoder to use its BISS session word to scramble the output MPEG stream. A decoder will need the Session Word in order to decrypt the stream. If an encoder's BISS is enabled without having a session word, the encoder asserts an 'Module Degrade - Configuration Error' alarm.

For more details on BISS encryption, see. 'EBU Technical Specification Tech 3292 (rev. 2, August 2002), BISS-E, Basic Interoperable Scrambling System with Encrypted Keys'.

BISS Session Word

Specifies the BISS Session Word for this program. The encoder allows its Session Word to be written and read – unlike the decoder, which protects its Session Word from being read. A Session Word behaves like a 'normal' configuration value. The encoder's Session Word is part of the system's configuration and may be stored internally a profile. Loading a stored profile or configuration file can alter Session Words for the system's encoders. Additionally, a Session Word follows the active service during module failover and failback.

– none – When no BISS scrambling is desired (or allowed), this value may be the empty string.

– string – Specifies the Session Word; a 12-character, hexadecimal string, such as 0a3b5c7d9e1f (upper-case and lower-case letters allowed). The 'New' button, described below, may be used to generate this string.

New (button)

Click this button to cause Vidiem™ to generate a unique new Session Word. Clicking this button replaces any existing text appearing in the 'BISS Session Word' entry box.

Include in Global Scrambler List (checkbox)

Check this box to add this Encoder, and its 'Session Word' to the global 'Scramblers' list. The global 'Scramblers' list appears in the drop down at the top of the "Tools > BISS Keys Dialog" on page 56.

BISS Encrypted Session Word Tool

Note: The controls in this bottom section of the screen are not settings, nor do they affect system settings.

These controls are provided to help create a the 'BISS Encrypted Session' word displayed at the bottom-right corner of the screen.

Decoder Injected Identifier

Enter the decoder's 'Injected Identifier' here.

BISS Encrypted Session Word (Read Only)

Indicates the Encrypted Session Word, which is derived from the 'BISS Session Word' and the 'Decoder's Injected Identifier'.

Related Topics

- "Overview of BISS Scrambling" on page 56.
- "Tools > BISS Keys Dialog" on page 56.
- "Tools > BISS Keys > New (button) > BISS Descrambler Dialog" on page 57.
- "Config > Decoder > Program > Descrambling Dialog" on page 302.
- "Config > Decoder > Program > Descrambling Injected Identifier Dialog" on page 303.

9.3.4 Config > Encoder > Program > Services Dialog

Abstract: *Use this dialog to access VANC data-related settings.*

Data

Closed Caption Source

Specifies the closed caption source for this program. Depending on the encoder, three sources of closed captions can be available. This parameter selects the active source and disables closed caption processing for the others.

none This option is available on all video encoders. Specifies the absence of a closed caption source, thus disabling closed captions.

udp This option is available on all video encoders. Some closed caption systems transmit their output through a serial port, according to the closed caption protocol. The NetVX does not accept this serial protocol directly. Instead, it relies on a serial-to-UDP conversion device (such as a Lantronix MSS-100) to receive serial characters and to re-transmit them over Ethernet. When using this arrangement, the NetVX's system controller monitors a specified UDP port for incoming characters and sends any characters it receives over the system backplane to the appropriate encoder.

Please see Section 3.3.3, "How to Use UDP to Insert Closed Captions Into an MPEG-2 Program" on page 68 for details on configuring the system to use this option.

vanc This option is available only on high-definition video encoders. This value directs the encoder to extract closed captions from VANC data.

vbi This option is available on the standard-definition video encoders. This value directs the encoder to extract 608 closed captions from VBI lines of the video (line 21 for NTSC). The VBI function must be set accordingly.

Closed Caption Translation

Specifies the closed caption translation behavior. An encoder can receive 608 and 708 closed captions from a variety of sources. If it receives 608 but not 708 captions, it can translate the incoming 608 captions to supply the ATSC 708 captions for downstream decoders.

always Enables 608-to-708 translation. Any incoming 708 captions are discarded, and translated 608 captions are used instead.

as-needed Enables 608-to-708 translation. If the input carries 708 captions, they are used to provide captions downstream. If, however, the input does not carry 708 captions, incoming 608 captions are translated and used to supply 708 captions. This process can be intermittent. For example, if the input has some segments with and some segments without 708 captions, the encoder will preserve 708 input and translate 608 input as necessary to provide continuous 708 captions.

none Disables 608-to-708 translation. Incoming 708 captions (if present) are preserved.

Event Schedule (Hr.)

Specifies the event schedule duration in hours. An encoder can have entries in its event Row table, giving information about upcoming content. This value specifies how much extended schedule information to include in the transport stream.

0 If the event Row table has entries, a zero schedule duration tells the encoder to generate a minimal event table with the present and following events. No extended schedule information will be sent, but the EIT will be present.

1 to 2400 A non-zero value gives the maximum schedule length. All events that start within the given time span will be included in the EIT.

Data Source

Use this control to specify the maximum rate at which data may enter the system through the source specified above. The encoder accepts data up to the configured data rate (described below). Excess data are discarded.

none Specifies the absence of a data source, thus disabling data insertion into the program stream.

udp Some systems generate out-of-band data that need to be passed to the decoder site. The encoder can receive data over UDP, merge them into the transport stream, and transmit the data to the decoder site. The system controller monitors the configuration database and specific UDP ports for incoming characters, sending them over the system backplane to the appropriate encoder.

Data Rate

Use this control to specify the maximum data bitrate for this program. When the data source specifies data input (value other than {none}), incoming data will be added to the encoder's program as a data stream. The encoder will discard data to avoid overrunning the configured bandwidth.

The encoder accepts data up to the configured rate and discards excess data. Given this rate, the associated transport stream bitrate can be computed:

```
ts_rate = data_rate * 188 / 175
```

Every transport stream packet (188 bytes) carries a 4-byte header. Packets with data also carry a 9-byte PES header, leaving 175 bytes for the data payload.

The encoder deducts a data stream's bandwidth from the overall transport stream rate when computing the video rate.

Splicing

Trigger

Specifies the trigger for splice point insertion. Some applications rely on insertion cueing to switch from a program's main to secondary material (such as a commercial). As defined by ANSI/SCTE 35-2004, Digital Program Insertion Cueing Message for Cable, information can be inserted in the program stream to coordinate these insertion points.

The following values enable cueing insertion using the designated contact switch as the insertion trigger. When the switch closes, the encoder sends 'In Point' information. When the switch re-opens, the encoder sends 'Out Point' information. The timing of the insertion cues depends on the pre-roll configuration (described above).

GPI-1 GPI 1 triggers the 'In Point' and 'Out Point' splice point insertions.

GPI-2 GPI 2 triggers the 'In Point' and 'Out Point' splice point insertions.

GPI-3 GPI 3 triggers the 'In Point' and 'Out Point' splice point insertions.

GPI-4 GPI 4 triggers the 'In Point' and 'Out Point' splice point insertions.

none This value disables splice point insertion.

tcp This value enables cueing insertion using the SCTE-104 protocol (simple profile only). The system and the automation server communicate using a TCP/IP connection. The system controller monitors the configuration database and specific TCP/IP ports for incoming connection requests. The controller then forwards protocol messages over the backplane to the appropriate encoder. The encoder ignores the splice point pre-roll value when using TCP triggering.

vanc This value enables cueing insertion using the SCTE-104 protocol (simple profile only) over VANC, as defined in SMPTE RP-2010. In this mode here is no return channel from the system (the injector) and the automation server; no response messages are sent. The encoder must be using digital video input to extract trigger information from VANC data (on DID 0x41, SDID 0x07 (See the "Well Known DID/SDID Pair" command on page 285. The encoder ignores the splice point pre-roll value when using VANC triggering.

Note: TCP Option: The encoder ignores the splice pre-roll (See the "Pre-Roll" command on page 264) value when using this option.

Note: TCP Option: When an automation system sends an encoder splice trigger information (SCTE-104) over Ethernet, it must use TCP/IP ports that are implicitly associated with NetVX slots. The IP port number for a given encoder is calculated as 65300 + slot #. For example, an automation server sending SCTE-104 information to an encoder in slot 4 should be configured to use the IP address of the NetVX system controller along with TCP port 65304.

Note: Multiple encoders are allowed to use the same GPI as a splice point trigger. For example, an encoder and its backup probably should use the same trigger GPI to ensure continued splice point insertion across a failover. Other applications might reasonably want identical splice point insertion.

Note: For GPI insertion to be active, the designated GPI function (See the "Function" command on page 218) must be configured to 'splice'. Other function values cause the encoder to behave as if it were configured with a trigger of 'none'.

GPI Mode

Specifies the splice point behavior for GPI triggers. When a program's 'Trigger' (See the "Trigger" command on page 263) value is set to any value between 'GPI-<1-4>', this parameter specifies the correspondence between 'In Point' and 'Out Point' with the GPI condition.

close-in Generates 'mark-in' when GPI closes. No action when GPI opens.

close-in-out (Default – 'Traditional' behavior) Generates 'mark-in' when GPI closes and 'mark-out' when GPI opens.

close-out Generates 'mark-out' when GPI closes. No action when GPI opens.

open-in Generates 'mark-in' when GPI opens. No action when GPI closes.

open-in-out Generates 'mark-in' when GPI opens and 'mark-out' when GPI closes.

open-out Generates 'mark-out' when GPI opens. No action when GPI closes.

Pre-Roll

Specifies the delay between a splice point trigger and its insertion. This value tells the encoder how long to wait between a splice point trigger and the insertion of the associated 'In Point' or 'Out Point'. SCTE 35-2004 recommends at least a 4 second interval between the first cueing message and the arrival of the associated 'In' or 'Out' Point.

0 The encoder inserts a splice point immediately.

0.001–10.000 The encoder inserts a splice point following this specified period of delay. This value specifies the time between the first cueing message and the arrival of the associated In or Out Point. SCTE 35-2004 recommends a minimum delay of 4 seconds, but the system allows a smaller interval.

Note: (1) When a trigger occurs, the encoder uses the current DTS (display time stamp) and the pre-roll value to compute the DTS for the next 'In Point' or 'Out Point'. (2) When the 'Point' time arrives, the encoder inserts the splice point as near to the computed time as possible. (3) The actual 'In Points' and 'Out Points' are not necessarily frame aligned.

Enable Splice Event Trap

Enables/disables the transmission of an event alarm (vancDeg, splice event) and its associated event trap when the encoder receives a splice trigger

Note: If you select two Dolby E or 2 SMPTE audio standards (Program > Services > Audio.x.1.x > Standard) or a combination of the two, the **Enable Splice Event Trap** option will automatically disabled, and you will get a warning message to that effect.

Related Topics

Section 7.4, "GPI Contacts Branch" on page 218

9.3.5 Config > Encoder > Video Dialog

Enable Video Processing

Check the desired boxes to allow the encoder to contribute these elementary streams to the program stream.

Note: Uncheck 'Enable Video Processing' to create an audio-only transport stream.

Input Source

Specifies the video input source and details.

Note: (1) The availability of some Input Source, Resolution, and Chroma Format selections is governed by feature keying. See the following for details:
- "ENC-S11 Module Types and Features" on page 476
- "ENC-S21 Module Types and Features" on page 477
- "ENC-H11 Module Types and Features" on page 478

(2) Options available to this control are governed by the SI/PSI Mode setting. See "SI/PSI Mode Table Transmission Rates and Other Parameter Constraints" on page 259 for details.

Input Source Options for Standard-Definition (ENC-S##-Series) Modules

Black-525 The encoder internally generates a black NTSC-compliant signal.

Black-625 The encoder internally generates a black PAL-compliant signal.

Composite, NTSC The encoder uses the 'Analog Vid' analog input and expects an NTSC-compliant signal.

Composite, NTSC-J The encoder uses the 'Analog Vid' analog input and expects an NTSC-J-compliant signal.

Composite, PAL The encoder uses the 'Analog Vid' analog input and expects a PAL-compliant signal.

Composite, PAL-M The encoder uses the 'Analog Vid' analog input and expects a PAL-M compliant signal.

SDI-525 The encoder uses the 'SDI Vid' digital input.

SDI-625 The encoder uses the 'SDI Vid' digital input.

(The following Input Source types are planned for a future release)

Automatic The encoder checks for a signal on the 'SDI Vid' digital input.
If this source is not providing input, the encoder checks the 'Analog Vid' composite input. If this source is not providing input, the encoder codes 'Black-525'.

Composite-Automatic The encoder uses the 'Analog Vid' analog input and detects the video standard automatically.

SDI-Automatic The encoder uses the 'SDI Vid' digital input and detects the video standard automatically.

Input Source Options for High-Definition (ENC-H##-Series) Modules

Black-525 The encoder internally generates a black NTSC-compliant signal.

Black-625 The encoder internally generates a black PAL-compliant signal.

Black, 720p 59.94 fps The encoder internally generates a black 1080i signal at 59.94 frames per second (fps).

Black,1080i 25 fps The encoder internally generates a black 1080i signal at 25 fps.

Black,1080i 29.97 fps The encoder internally generates a black 1080i signal at 29.97 fps.

SDI-525 The encoder uses the 'SDI Vid' digital input.

SDI-625 The encoder uses the 'SDI Vid' digital input.

SDI, 720p 50 Hz. The encoder uses the 'HD-SDI In' digital input and expects a 720p signal at 50 fps.

SDI, 1080i, 25 Hz The encoder uses the 'HD-SDI In' digital input and expects a 1080i signal at 25 fps.

SDI, 1080i, 29.97 Hz The encoder uses the 'HD-SDI In' digital input and expects a 1080i signal at 29.97 fps.

Resolution

Use this control to specify the input video resolution. Each selection option has the following characteristics.

Table 9-6 Input Resolution, Possible Frame Rate Settings, Standards, and Coded Lines Per Field

Format	Input	Standard/Extended Resolution-Chroma	Coded Frame Rate* (*ENC-A11 only)	Resolution Support by Module					Coded Lines	
				ENC-H11	ENC-S21	ENC-S11	ENC-A11	ENC-A21	Field 1	Field 2
High-Definition, 720p	black-720-50 black-720-59 sdi-720-50 sdi-720-59	std-1280-420	Frame-Auto	●	❍	❍	❍	●	26 to 745	n/a
		std-1280-422		●	❍	❍	❍	❍		
High-Definition, 1080i	black-1080-25 black-1080-29 sdi-1080-25 sdi-1080-29	std-1440-420	Frame-Auto	●	❍	❍	❍	●	21 to 560	584 to 1123
		std-1440-422		●	❍	❍	❍	❍		
		std-1920-420		●	❍	❍	❍	●		
		std-1920-422		●	❍	❍	❍	❍		
High-Definition, 1080-film Segmented Frame	black-1080-24sf sdi-1080-24sf	std-1440-420	Frame-Auto	●	❍	❍	❍	●	21 to 560	584 to 1123
		std-1440-422		●	❍	❍	❍	❍		
		std-1920-420		●	❍	❍	❍	●		
		std-1920-422		●	❍	❍	❍	❍		
Standard Definition NTSC Reduced (120 Lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	qcif-176-420	5, 10, 15, 25, 30 fps	❍	❍	❍	●	❍	22 to 261	n/a
Standard Definition NTSC Reduced (240 Lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	cif-352-420	5, 10, 15, 25, 30 fps	❍	❍	●	●	●	22 to 261	n/a

Table 9-6 Input Resolution, Possible Frame Rate Settings, Standards, and Coded Lines Per Field

Standard Definition, NTSC Standard (480 Lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	std-352-420	Frame-Auto	❍	●	●	●	●	22 to 261	285 to 524
		std-528-420		❍	●	●	❍	●		
		std-544-420		❍	●	●	●	●		
		std-640-420		❍	●	●	❍	●		
		std-704-420		❍	●	●	●	●		
		std-720-420		●	●	●	●	●		
		std-720-422		●	❍	●	❍	❍		
Standard Definition, NTSC Extended (512 Lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	ext-720-420	5, 10, 15, 25, 30 fps	●	❍	●	●	❍	7 to 262	270 to 525
		ext-720-422		●	❍	●	❍	❍		
Standard Definition, PAL Reduced (144 Lines)	black-625 comp-pal sdi-625	cif-176-420	5, 10, 15, 25 fps	❍	❍	❍	●	❍	23 to 310	n/a
Standard Definition, PAL Reduced (288 Lines)	black-625 comp-pal sdi-625	cif-352-420	5, 10, 15, 25 fps	❍	❍	●	●	●	23 to 310	n/a
Standard Definition, PAL Standard (576 Lines)	black-625 comp-pal sdi-625	std-352-420	Frame-Auto	●	●	●	●	●	23 to 310	336 to 623
		std-528-420		●	●	●	❍	●		
		std-544-420		●	●	●	●	●		
		std-640-420		❍	●	●	❍	●		
		std-704-420		●	●	●	●	●		
		std-720-420		●	●	●	●	●		
		std-720-422		●	❍	●	❍	●		
Standard Definition, PAL Extended (608 Lines)	black-625 comp-pal sdi-625	std-720-420	Frame-Auto	●	●	●	●	●	7 to 310	320 to 623
		std-720-422		●	❍	●	❍	●		
Standard Definition VGA Reduced 16:9 Aspect Ratio (96 lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	sqvga-160-420	5, 10, 15, 25, 30 fps	❍	❍	❍	●	❍	22 to 261	NA
	black-625 comp-pal sdi-625	sqvga-160-420	5, 10, 15, 25 fps	❍	❍	❍	●	❍	23 to 310	NA
Standard Definition VGA Reduced 4:3 Aspect Ratio (120 lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	sqvga-160-420	5, 10, 15, 25, 30 fps	❍	❍	❍	●	❍	22 to 261	NA
	black-625 comp-pal sdi-625	sqvga-160-420	5, 10, 15, 25 fps	❍	❍	❍	●	❍	23 to 310	NA

Table 9-6 Input Resolution, Possible Frame Rate Settings, Standards, and Coded Lines Per Field

Standard Definition VGA Reduced 16:9 Aspect Ratio (192 lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	qvga-320-420	5, 10, 15, 25, 30 fps	❍	❍	❍	●	●	22 to 261	NA
	black-625 comp-pal sdi-625	qvga-320-420	5, 10, 15, 25 fps	❍	❍	❍	●	●	23 to 310	NA
Standard Definition VGA Reduced 4:3 Aspect Ratio (240 lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	qvga-320-420	5, 10, 15, 25, 30 fps	❍	❍	❍	●	●	22 to 261	NA
	black-625 comp-pal sdi-625	qvga-320-420	5, 10, 15, 25 fps	❍	❍	❍	●	●	23 to 310	NA

Enable Film Detection

Enables/disables film mode detection. Film is normally shot at 24 frames/sec, compared to 25 frames/sec for PAL, (about) 30 interlaced frames/sec for NTSC, and (about) 60 progressive frames/sec for 720P. Transferring film material to 30 or 60 frames/sec uses a process called 3:2 pull-down. For every pair of film frames, 5 interlaced fields (or progressive frames) are generated. The first frame has 3 fields, with the first and third identical. The second frame has 2 fields. (Two film frames at 24 frames/sec take the same time as five fields at 30 frames/sec.) The encoder can work more efficiently if it recognizes the repetition pattern, and this parameter tells the encoder how to process the source material.

If the input material is not appropriate for 3:2 pull-down (24 or 25 Hz input), the encoder ignores the film mode setting. (The difference between 24 and 25 frames/sec is small enough to ignore, and 3:2 pull-down is not used.)

enable Expect input to be film or video; the encoder chooses the appropriate encoding for the source material. The encoder will switch between film and video mode if the 3:2 repetition pattern persists or ceases for a long enough time.

disable Don't attempt to identify the film mode repetition sequence.

Chroma Format

Use this control to specify the chroma format of the compressed video.

Note: Availability of the some Chroma Format selections is governed by feature keying. See the following for details:
- "ENC-S11 Module Types and Features" on page 476
- "ENC-S21 Module Types and Features" on page 477
- "ENC-H11 Module Types and Features" on page 478

4:2:0 This setting is typically used for distribution-quality video that may be broadcast to consumers.

4:2:2 This format is typically used for contribution-quality video which may be exchanged between production, post-production, and broadcast/uplink facilities.

Coding

Minimum Quant.

Use this control to specify the minimum quantization level.

1 The encoder chooses its own quantization values.

2–31 The encoder attempts to use the specified value.

Pre-Processing

Specifies the video pre-processing to apply. Depending on the program rate and other properties of the video, some pre-processing can help improve the apparent picture quality. This value tells the encoder what set of video pre-processing to use.

Automatic This value lets the encoder select its own pre-processing. Typically, the encoder will vary the filters to make the picture look good to the eye.

None This value disables video pre-processing. Disabling pre-processing sometimes helps preserve details of the original input. This setting can improve the results of some measurement equipment, even though the picture might look worse to a human.

sharp This value lets the encoder select its own pre-processing, giving preference to preserving sharp edges and picture detail. Compared with soft, this may sometimes introduce blocky artifacts, when the video complexity exceeds the available bandwidth to convey the detail.

soft This value lets the encoder select its own pre-processing, giving preference to reducing blocky coding artifacts. Compared with sharp, this may sometimes blur fine detail when the video complexity exceeds the available bandwidth to convey the detail.

Vertical Offset

Use this control to specify the number of lines to shift the first line of encoded video. This setting does not affect VBI line settings or the overall number of lines received by decoders. The range of allowable offsets varies according to the 'Resolution' selection. See the last column in Table 9-6, "Input Resolution, Possible Frame Rate Settings, Standards, and Coded Lines Per Field" on page 266 for the offset range.

Coded Frame Rate

This parameter specifies the coded frame rate in frames per second. Most often, the coded picture rate (output frames/sec) matches the input, but this parameter gives a way to code fewer pictures. This approach is typically used for low-bandwidth applications, such as mobile receivers.

Auto This value tells the encoder to code all the pictures it receives. The coded frame rate matches the input frame rate.

5, 10, 15, 25, 30 These values tell the encoder to generate coded frames at the indicated rate (in frames/sec). The values are close approximations to the actual frame rate. For example, NTSC input operates at 29.97 frames/sec, but frame-30 is treated as equivalent.

9.3.6 Config > Encoder > Video > Video Picture Dialog

GOP (Group of Pictures)

The controls in this section work together to create the following GOP structures.

Specifies the GOP structure. This variable provides composite information on the GOP structure, including the picture types and whether the GOPs should be open or closed.

An MPEG-2 group of pictures contains I-, P-, and B-frames, with an I-frame as the first picture in the bit stream, but an I- or B-frame as the first picture in display order. An open GOP allows B-frames to reference pictures in other GOPs. Although this approach allows more efficient encoding, it also means a GOP is not self-contained, because a B-frame may need an I-frame in the previous GOP to decode properly. Some applications, such as storing video clips on a server, require closed GOPs, allowing each GOP to be decoded independently.

The NetVX handles this condition by manipulating the I-frame spacing. Technically, MPEG-2 allows an encoder to construct B-frames that reference only preceding or following pictures (in display order). Thus a closed GOP could be constructed by preventing a B-frame from referencing pictures outside its GOP. Alternatively, the encoder can force every GOP to begin with an I-frame and to end with an I-frame or a P-frame in display order, thus ensuring all B-frames have both a backward and a forward picture to reference from their own GOP. The NetVX uses this second method when generating closed GOPs.

The default for all modules, except the ENC-A21, is

gop-1B-closed, gop-1B-open These values tell the encoder to generate 1 B-frame between I- and P-frames (IBPBP...). The GOP will be open or closed, as noted.

gop-2B-closed, gop-2B-open These values tell the encoder to generate 2 B-frames between I- and P-frames (IBBPBBP...). The GOP will be open or closed, as noted.

gop-2B-closed-low, gop-2B-open-low These values tell the encoder to generate 2 B-frames between I- and P-frames (IBBPBBP...). The GOP will be open or closed, as noted. The encoding will be suitable for a low latency service.

gop-3BH-closed, gop-3BH-open These values tell the encoder to generate 3 B-frames between I- and P-frames, using 2-level hierarchical encoding. The GOP will be open or closed, as noted. Unlike MPEG-2, which does not use B-frames to predict other pictures, H.264 allows a 2-level hierarchy, and the center of three consecutive B-frames helps predict the B-frames adjacent to it. Using R to represent referenced B-frames, the 2-level hierarchy could code pictures with the following sequence: IBRBPBRBP... (Note: gop-3BH-open is the default on the ENC-A21).

gop-7BH-closed, gop-7BH-open These values tell the encoder to generate 7 B-frames between I- and P-frames, using 3-level hierarchical encoding. The GOP will be open or closed, as noted. Unlike MPEG-2, which does not use B-frames to predict other pictures, H.264 allows a 3-level hierarchy, and intermediate B-frames help predict other B-frames adjacent to them. Using R to represent referenced B-frames, the 3-level hierarchy could code pictures with the following sequence: IBRBRBRBPBRBRBRBP....

gop-I This value tells the encoder to use only I-frames.

gop-IP This value tells the encoder to generate I-frames and P-frames but no B-frames (IPPP....

gop-IP-low This value tells the encoder to use only I- and P-frames, with encoding suitable for a low-latency service.

GOP Selection Guidelines

Due to video coding techniques, typical I-frames consume more bits than P-frames, which consume more bits than B-frames. Consequently, GOP structure affects the relationship between bitrate and picture quality. Encoders generally impose no limits on combinations of rates and GOP structure, but the following guidelines should be observed.

- When coding only I-frames (gop-I), the ENC-H11 should use a minimum transport stream rate of 25 Mbps. Lower rates may degrade video quality with difficult material, especially when other program elements (audio, …) consume a significant amount of the program's bandwidth.
- We discourage the use of gop-I coding (for all encoders).
- MPEG-2 anchors prediction points at I-frames and P-frames. Intervening B-frames reference only the closest the I- and P-frame pictures. H.264 relaxes these restrictions, allowing B-frames to reference I- and P-frames that are outside their closest neighbors (in addition to other B-frames). This flexibility alters the notion of open and closed GOPs and affects the placement of edit points in the video stream. As a practical matter, the system's H.264 encoders currently limit their use of the full H.264 facilities. The encoders insert a recovery point SEI message at each I-frame, providing synchronization points for downstream applications (decoders, editors, etc.).

Use All I-Frames

Specifies that the encoder should construct each GOP structure exclusively out of I-frames. If checked, this setting disables some of the other GOP settings on this screen.

Use Low-Delay Encoding

Specifies that the encoder should construct closed GOPs using only I and P frames. If checked, this setting overrides both the 'Number of B-Frames' and the 'Close all GOPs' settings (below).

In 1080i, the ENC-H11's low delay mode operates at 332ms.

In 720p, the ENC-H11's low-delay mode operates at 350ms.

Number of B-Frames

Specifies the number of B-frames the encoder should include each group of pictures (GOP) structure.

0	The encoder creates GOPs that do not include any B-frames between each I-frame and P-frame.
1	The encoder creates GOPs that include a single B-frame between each I-frame and P-frame.
2	The encoder creates GOPs that include two B-frames between each I-frame and P-frame.

Close All GOPs

Use this control to set one aspect of the encoder's group of pictures (GOP) structure.

Unchecked	The encoder creates open GOPs. An open GOP allows B-frames to reference pictures in other GOPs. Although this allows more efficient encoding, it also means a GOP is not self-contained because a B-frame may need an I-frame in the previous GOP to decode properly.
Checked	The encoder creates closed GOPs. Some applications, such as storing video clips on a server, require closed GOPs, allowing each GOP to be decoded independently.

Progressive Refresh

Specifies the type of progressive refresh the encoder should use.

None	Encoder does not use progressive refresh.
prog_mb	Select progressive I macroblock refresh.
rand_mb	Select random I macroblock refresh.
prog_i	Select progressive I macroblock refresh with IDR frames.
rand_i	Select random I macroblock refresh with IDR frames.
gop_only	Add occassional I-frames with no progressive refresh.

GOP Size

This variable specifies the GOP length. Encoders treat the specified value as a suggestion of intent, not a rule. Encoders can vary the actual GOP size based on input material, hardware capabilities. Typical values are presented in the table below.

Table 9-7 Nominal GOP Size Based on 'Encoder', 'Input Signal', 'GOP Structure' and 'GOP Size' Setting

Encoder Type	Input Signal	GOP Structure	GOP Size Setting				
			'Short'	'Medium'	'Long'	Very-Long	Ultra-Long
ENC-A21	NTSC PAL SDI (SD) 480I 1080I	I	1	1	1	1	1
		IP 1B 2B	12	24	30	60	90
		3BH 7BH	8	16	32	48	64
	720P	I	1	1	1	1	1
		IP 1B 2B	24	48	60	120	180
		3BH 7BH	16	32	64	96	128
ENC-A11 ENC-H11 ENC-S11 ENC-S21	NTSC PAL SDI (SD) 480I 1080I	I	1	1	1	1	1
		IP 1B 2B	6	12	15	30	45
		3BH 7BH	N/A	N/A	N/A	N/A	N/A
	720P	I	1	1	1	1	1
		IP 1B 2B	12	24	30	60	90
		3BH 7BH	N/A	N/A	N/A	N/A	N/A

Note 1: We have found longer GOPs to be more effective for faster frame rates.

Note 2: The ENC-A11 and ENC-A21 use variable-sized GOPs, depending on the dynamic video characteristics. The size ranges from 1 to 20 for short, from 1 to 30 for medium, and from 1 to 60 for long.

Note 3: An encoder can adjust the values above to account for open or closed GOP structure.

Note 4: The ENC-S11 treats 'very-long' and 'ultra-long' the same as 'long'.

Presentation

AFD Default

Use this parameter to specify the default Active Format Description (AFD). As described by the aspect ratio, a transport stream can carry information describing the source and the display aspect ratios. When the encoder inserts an AFD without information from the input signal, this value provides the active_format to use.

See ETSI TR 101 154 V1.4.1 (2000-07), Digital Video Broadcasting (DVB); Implementation guidelines for the use of MPEG-2 Systems; Video and Audio in satellite, cable and terrestrial broadcasting applications. The following options (except for 'none') are from Annex B of that specification.

none	This value explicitly indicates not to insert AFD, unless the input stream carries aspect ratio information.
0	Reserved
1	Reserved
2	box 16:9 (top)
3	box 14:9 (top)
4	box > 16:9 (center)
5 to 7	Reserved
8	Active format is the same as the coded frame
9	4:3 (center)
10	16:9 (center)
11	14:9 (center)
12	Reserved
13	4:3 (with shoot & protect 14:9 center)
14	16:9 (with shoot & protect 14:9 center)
15	16:9 (with shoot & protect 4:3 center)
drop	This value explicitly indicates to drop AFD, even if the input stream carries aspect ratio information. This, however, does not impact the VANC DID filter setting.

Aspect Ratio

Use this parameter to specify the video aspect ratio. Although this does not imply a format conversion by the encoder, it does allow the encoder to put the given aspect ratio into the MPEG stream. A decoder could use this information to display the material appropriately, preserving the aspect ratio from the input camera to the output monitor.

An Active Format Description (AFD) (See AFD Default) carries information about the picture, in addition to the aspect ratio. Decoders can use the AFD to match the stream's video to display characteristics, or to insert video index information in the outgoing signal. When a stream carries AFD, many decoders use that information exclusively, ignoring the decoder's configuration specific to the attached display. Undesirable results can occur when the actual aspect ratio of the encoder's video source does not match the aspect ratio configured for the encoder.

aspect-4x3	The input has the (standard definition) 4 by 3 aspect ratio.
aspect-16x9	The input has the widescreen aspect ratio of 16 by 9.
auto-4x3	Automatically detects the aspect ratio from the source. If that value is not available, uses 4x3.
auto-16x9	Automatically detects the aspect ratio from the source. If that value is not available, uses 16x9.

Note: When the fixed aspect ratios such as 'aspect-4x3', or 'aspect-16x9' are used, the encoder inserts AFD according to the configured default value. In case of a mismatch between the encoder input and the configured aspect ratio, the decoder's display properties are allowed to take priority.

Note: When the automatic ratios 'auto-4x3', 'auto-16x9' tell the encoder to examine the input for aspect ratio information and use that to build the AFD. If dynamic source information is unavailable, the automatic ratios inserts the configured default value.

9.3.7 Config > Encoder > Video > Video Control Dialog

Abstract: *Use these check boxes to enable and disable alarm notifications to only those signals that are applicable to this encoder.*

Enable Video Degrade

Check this box to enable Video Degrade alarming for this encoder.

Enable Video Fault

Check this box to enable Video Fault alarming for this encoder.

Note: All alarms categories are described in further detail in the topic "Overview of NetVX Alarms" on page 214.

Router

Use these controls to configure the encoder to operate with video and audio routers. See the topic "Receive Interface Router Settings" on page 450 for details.

9.3.8 Config > Encoder > Audio Properties Dialog

Enable Audio Processing

Pace a check mark in this box to enable this audio channel.

Separate Audio Input

Use this option and associated list items to specify a non-embedded audio source.

Note: (1) Availability of the second Input Source selection is governed by feature keying. See the following for details:
- "ENC-S11 Module Types and Features" on page 476
- "ENC-S21 Module Types and Features" on page 477
- "ENC-H11 Module Types and Features" on page 478

(2) Options available to this control are governed by the SI/PSI Mode setting. See "SI/PSI Mode Table Transmission Rates and Other Parameter Constraints" on page 259 for details. Audio channel (Audio 2) is governed by the encoders feature set (see links above for details).

Automatic	((Available in a future release)) The encoder attempts to use each of the following inputs, in the following order: (1) digital input, (2) embedded input, (3) analog input.
Digital	The encoder uses the digital audio input.
Analog	The encoder uses the analog audio input.
Mute	The encoder encodes silence as the audio.
Tone	The encoder codes a test tone.

Embedded Audio Input

Use this option and associated list items to specify an embedded group and channel audio source.

Analog Input Level

Use this control to specify the analog audio input level. The following table describes each selection.

Consumer	Use this setting to receive input from consumer audio gear such as CD and DVD players. Using this setting, input should be between -10dBV or -7.8 dBu (nominal) and +10 dBV or 12.2 dBu (full scale).
DVB	Use this setting to receive input from DVB-compliant studio gear. Using this setting, input should be between +4 dBu (nominal) and +18 dBu (full scale).
Pro 20	Use this setting to receive input from Sony SDIF equipment. This audio input level is not recommended. When using this setting, the Input should be between +4 dBu (nominal) and +20 dBu (full scale).
Pro 24	Use this setting for typical U.S. professional audio equipment. When using this setting, the Input should be between +4 dBu (nominal) and +24 dBu (full scale).

Gain (dB)

Use this control to specify the amount of attenuation (-) or gain (+) that the encoder should apply to the audio input prior to encoding.

Note: Gain is *not* applied to externally compressed audio.

Coding

Standard

Use this control to indicate how the encoder should treat audio input.

Note: (1) Availability of Standard selections marked with an * are governed by feature keying. See the following for details:
- "ENC-S11 Module Types and Features" on page 476
- "ENC-S21 Module Types and Features" on page 477
- "ENC-H11 Module Types and Features" on page 478

(2) The 'MPEG', 'AC-3', and 'SMPTE-302M' options available to this control are governed by the SI/PSI mode setting. See "SI/PSI Mode Table Transmission Rates and Other Parameter Constraints" on page 259 for details.
(3) The selection made is applied to all three audio encoders with the exception of any single audio encoder configured for 'SMPTE-302M'.

MPEG Use this setting for MPEG audio compression.

AAC Use this selection for AAC encoding. This option is only available on the MPEG-4/H.264 encoders.

AC-3 Use this setting for AC-3 audio compression.

External Compression Use this setting to add audio compressed by external equipment to the bit stream.

SMPTE-302M Use this setting to add uncompressed audio to the bit stream. Use the SMPTE 302M Precision Bits (described below) to set the sample size.

Bitrate

Use this control to specify the bit rate.

Note: Options available to this control are governed by the audio 'Standard' setting described above. Only rates that are compatible with the selected standard are presented.

SMPTE 302M Precision (bits)

Select the 'SMPTE 302" audio 'Standard' selection to enable this control.
Use this control to set the sample size (aka: precision bits, or bits per sample).

Table 9-8 SMPTE 302M Audio Rates as a Function of Sample Size

Sample Size (bits)	Nominal Audio Rate (bps)	Transport Stream Rate (bps)
16	1920000	2016000
20	2304000	2419200
24	2688000	2822400

Channel

Specifies the audio channel (PMT entry) to create in the transport stream.

0 The encoder selects the PMT entry to assign to this audio stream.

1 to 65535 The encoder inserts this audio stream into the specific PMT audio entry.

Note: (1) A unique PMT audio entry must be specified for each audio channel on a given encoder.
(2) The encoder's selected PMT audio entries must be contiguous.
(3) The combination of explicit assignments (non-zero values) and implicit assignments (zero values) should select all entries from 1 to the number of audio streams in the program.
(4) The encoder declares and alarm (audDeg, configuration error) if any of the above constraints are violated.

Audio Coding Mode

Use this control to select how the encoder should treat the audio input.

stereo	Dual channel stereo.
mono	Mono.
dual-mono	Mono is provided on both stereo channels (MPEG-only).
parametric-stereo	This mode is used with low-bitrate AAC-only.
5.1	Use this setting in conjunction with 5.1 channel surround sound.

Note: Options available to this control are governed by the SI/PSI mode setting. See "SI/PSI Mode Table Transmission Rates and Other Parameter Constraints" on page 259.

- Section 9.2.3.1, "AAC-HE, AAC-LC Audio “Standard” and “Mode” Settings" on page 248
- Section 9.2.3.2, "AC-3 Audio “Standard” and “Mode” Settings" on page 251
- Section 9.2.3.3, "Externally-Compressed Audio Settings" on page 252
- Section 9.2.3.4, "MPEG Audio “Standard” and “Mode” Settings" on page 253
- Section 9.2.3.5, "SMPTE 302 Audio Settings" on page 254

Note: There are dependencies between the ‘Bitrate’, the ‘Standard’, and the ‘Audio Coding Mode’ controls. Vidiem™ ensures your selection form valid combinations.

Delay

Use this control to specify the amount to offset audio (in milliseconds) relative to video.

9.3.9 Config > Encoder > Audio Properties > Advanced Dialog

Bitstream Information

Indicate Copyright

Check this box to indicate the audio is copyright protected.

Indicate Deemphasis

Check this box to indicate the audio is de-emphasized. The meaning of this checkbox varies according to the form of audio compression being used.

When coding AC-3...	The encoder applies deemphasis prior to audio compression.
When coding MPEG...	The encoder sets a flag in the audio stream that directs downstream equipment to apply deemphasis.

Note: Options available to this control are governed by the SI/PSI mode setting. See "SI/PSI Mode Table Transmission Rates and Other Parameter Constraints" on page 259.

Indicate Original Bitstream

Enables the audio flag indicating first generation, original material.

ISO Language Code

Use this control to specify the audio language code. When using the MPEG 'Dual Mono' coding option use 'ISO Language Code 2' to specify the language code for the second mono audio channel.

ISO 639-2 defines language codes (http://www.loc.gov/standards/iso639-2/).

This control also accepts text input, so any other ISO-639-2-compliant country code may be entered as well.

Production Information [AC-3 mode only]

Check this box to include 'Production Information' in the bit stream.

Mix Level (dB SPL)

Indicates the type and calibration of the mixing room used for the final audio mixing session.

Room Type

Indicates the type and calibration of the mixing room used for the final audio mixing session. This property is typically set to 'unknown'.

Service Configuration [AC-3 mode only]

Service Type

Use this control to indicate the type of audio service that the bit stream conveys.

Complete Main	Main audio service.
Music and Effects	Music & Effects main audio service.
Visually Impaired	Visually Impaired associated service.
Hearing Impaired	Hearing Impaired associated service.
Dialogue	Dialog associated service.
Commentary	Commentary associated service.
Emergency	Emergency associated service.
Karaoke	Reserved associated service.

Dialog Normalization (dB)

Use this control to set the dialog level relative to digital full-scale level for the first mono audio channel when operating in the dual mono (1+1) audio coding mode.

9.3.10 Config > Encoder > Audio Properties > Advanced AAC Dialog

AAC Transport

Use this parameter to specify the audio 'stream_type' field in the PMT and the audio encapsulation format used for the stream.

auto	This setting is dependent upon the standard (Standard) setting. If the 'standard' is set to 'AAC-LC*...' then this parameter defaults to 'ADTS'. If the 'standard' is set to 'AAC-HE*...' then this parameter defaults to 'loas'.
adts	This setting specifies 'Audio Data Transport Stream'. This setting is typically used with AAC-LE-formatted audio.
loas	This setting specifies 'Low Overhead Audio Stream'. This setting is typically used with HE-AAC-formatted audio.
Note:	This feature is only applicable when the audio standard (Standard) is set to any of the "AAC..." selections.

AAC Version

Some decoders have difficulty processing MPEG-4 HE-AAC audio; use this parameter to specify an 'AAC-LC' alternative.

auto	This option effectively uses the 'MPEG-4' selection below.
mpeg-2	The audio standard (Standard) setting affects this option in the following manner. If the audio standard is set to 'AAC-LC' then the 'MPEG-2 AAC-LC' format is used. If the audio standard is set to 'AAC-HC' then the 'MPEG-2 AAC-LC + SBR' format is used.
mpeg-4	The audio standard (Standard) setting affects this option in the following manner. If the audio standard is set to 'AAC-LC' then the 'MPEG-4 AAC-LC' format is used. If the audio standard is set to 'AAC-HC' then the 'MPEG-4 AAC-LC + SBR' format is used.
Note:	(1) This feature is only applicable when the audio standard (Standard) is set to any of the 'AAC...' selections. (2) The 'MPEG-2' option is not valid when the standard (Standard) is set to 'AAC...' and the mode (Standard) is set to 'parametric-stereo'.

AAC SBR Signaling

This parameter provide two options for signaling the presence of SBR data in the audio stream.

auto — If the simode (SI/PSI Mode) is set to 'isdb-tb-fixed' or 'isdb-tb-mobile' then 'explicit-hier' is used; otherwise 'implicit' is used.

explicit-hier — Use this option to create a stream that shall explicitly indicate the presence of SBR data. When this option is used, hierarchical signaling is used in order to indicate the underlying audio object type.

implicit — Use this option to create a stream that implicitly signals the presence of SBR data.

Note: This feature is only applicable when
(1) The audio standard (Standard) is set to any of the 'AAC-HE*...' settings
(2) 'Aactransport' (AAC Transport) must be set to 'auto' or 'loas'.
(3) 'Aacversion' (AAC Version) must be set to 'auto' or 'MPEG-4'.

Note: All HE AAC-Profile decoders are supposed to be able to detect SBR in 'implicit'-coded streams.

AAC PS Signalling

Use this parameter to specify the type of parametric stereo signaling for AAC audio encoding.

auto — This value instructs the encoder to select the SBR signaling that is most appropriate based on the program's SI-Mode (SI/PSI Mode).

When the SI/PSI Mode is set to 'atsc-mph', this option (auto) sets this parameter to 'Explicit'.

When the SI/PSI Mode is set to anything other than 'atsc-mph', this option (auto) sets this parameter to 'Implicit'.

explicit — This value explicitly indicates parametric stereo signaling in the audio stream.

limplicit — This value implicitly signals parametric stereo in the stream.

Note: This parameter is applicable only when the audio standard (Standard) is set to one of the 'aac-he-*' values.

9.3.11 Config > Encoder > Video > Audio Channel Dialog

Abstract: *Use these check boxes to enable and disable alarm notifications to only those signals that are applicable to this encoder.*

Enable Audio Degrade

Check this box to enable Audio Degrade alarming for this audio encoding channel.

Enable Audio Fault

Check this box to enable Audio Fault alarming for this audio encoding channel.

Note: All alarms categories are described in further detail in the topic "Overview of NetVX Alarms" on page 214.

Router

Use these controls to configure the encoder to operate with video and audio routers. See the topic "Receive Interface Router Settings" on page 450 for details.

9.3.12 Config > Encoder > Events Dialog

Event

Entries
This list provides an entry for each ‘Event’ in the event table.

UTC Start Date
Use this control to enter the date on which the encoder should start embedding this ‘Event’ message in the bit stream.

UTC Start Time
Use this control to enter the time at which the encoder should start embedding this ‘Event’ message in the bit stream.

Name
Enter the name of the event in this entry box.

Description
Enter a description of the event in this entry box.

9.3.13 Config > Encoder > Events > Event Content Dialog

Event Content

Note: Options available to controls in this dialog are governed by the SI/PSI mode setting. See "SI/PSI Mode Table Transmission Rates and Other Parameter Constraints" on page 259.

Parental Rating
Specifies the event rating. Used by program guides to give parental rating information, including age and material information, for the event. The following standards specify how this value is used in each SI Mode.

ATSC ATSC Standard A/65C. Program and System Information Protocol for Terrestrial Broadcast and Cable, Section 6.9.3.

DVB ETSI EN 300 468 v1.7.1 (2006-05). Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems, Section 6.2.27, Table 73.

ISDB SBTVD Forum, Brazilian Digital Television Forum, Standard Number 3. Multiplexing and Service Information. Part 2, Section 8.3.11.

Genre
Specifies the Event Genre and is used by program guides to classify the content of the event. The standards listed under ‘Parental Rating’ (above) describe how this value is used in each SI Mode.

User Genre
Specifies the event genre (user-defined). Typically used by program guides to classify the content of the event. Unlike the ‘Genre’, which is defined by standards, this value is defined by the broadcaster.

9.3.14 Config > Encoder > VANC Data Dialog

Entries

This list provides an entries for each possible service that may be used.

Overall VANC Control

Total VANC Data Rate (Kbps)

Use this control to specify the total Vertical Ancillary Data (VANC) bit rate for this program.

0 This selection inhibits VANC data from entering the encoder's transport stream output.

0.01–2.0 Mbps Specifies the amount of bandwidth the encoder should allocate for VANC data, obtained from the encoder's input. The encoder will discard data to avoid overrunning the configured bandwidth.

This configured value is divided by the video frame rate to determine the data limit per frame. Data are extracted from the input and copied to the output, up to the limit of the current frame. Any additional data are dropped, potentially causing an alarm (vancDeg, VANC Overflow).

Note: See the DID filtering (Section 9.3.15, "Config > Encoder > VANC Data > VANC Services Dialog" on page 285) for details about how to select what input data to transfer or discard.

KLV Metadata Rate (Kbps)

Use this control to specify the maximum bitrate for KLV-encoded metadata. See Section 9.3.16, "Overview of KLV Metadata Processing" on page 286 for details.

0 Disables KLV metadata from entering the encoder's transport stream output.

0.01 to 2.0 Allocates bandwidth for data, obtained from the encoder's input. Metadata are carried in their own packetized elementary stream. The encoder discards data to avoid overrunning the configured bandwidth.

OP-47 Peak Lines/Frame

Use this control to specify the maximum number of OP-47 teletext lines per frame to process.

0 Disables OP-47 teletext processing.

1 to 34 The encoder uses this value to allocate sufficient bandwidth to carry the specified number of lines, obtained from the encoder's input. The encoder will discard data as necessary to avoid overrunning the configured maximum teletext lines per video frame.

When computing the transport stream bandwidth associated with OP-47 subtitling, the data are packaged similar to VBI function {wst} using EN-300-472. Note that OP-47 processing always uses the EN-300-472 transmission format, regardless of the VBI teletext mode. The presence of OP-47 lines can insert a VBI teletext descriptor into the transport stream.

Teletext from VANC data can be carried two separate ways in the transport stream. Both methods extract VANC data from DID and SDID (0x43, 0x02) for subtitling distribution packets or from (0x43, 0x03) for VANC multi-packets.

(1) If the OP-47 line count is configured to a non-zero value, then any teletext lines are carried in their own packetized elementary stream (this includes both subtitling distribution packets and multi-packets carrying teletext subtitling).

(2) Additionally, a VANC service can be defined to filter on the DID and SDID, which would extract the subtitling, combine it with other VANC services, and carry the aggregate VANC services in the stream.

This aggregate data stream's rate is controlled by the VANC rate. Either or both methods can be used to extract OP-47 subtitling, resulting in zero, one, or two copies of the subtitling in the transport stream. See DID Filtering (Section 9.3.15, "Config > Encoder > VANC Data > VANC Services Dialog" on page 285) for details about how to select what input data to transfer or discard.

Note 1: OP-47 is described in: “Free TV Australia Operational Practice OP-47, Storage and Distribution of Teletext Subtitles and VBI Data for High Definition Television”, Issue 3, April 2007.

Note 2: This configured subtitling line count applies to one video frame. Data are extracted from the input and copied to the output, up to the limit of the current frame. Any additional subtitling lines are dropped (and counted explicitly as dropped OP-47 lines), potentially causing an alarm (vancDeg, VANC error). Note that subtitling packets dropped as part of VANC service processing are counted as general VANC dropped packets, not specifically as dropped OP-47 lines.

Note 3: Only one of KLV metadata and OP-47 teletext subtitling can be active. If both this OP-47 line count and the KLV metadata rate are non-zero, the module will assert an alarm (modDeg, configuration error).

Note 4: This feature was introduced in NetVX Firmware Release 7.7.0. This release support OP-47 only on the ENC-H11.

9.3.15 Config > Encoder > VANC Data > VANC Services Dialog

Enable DID Filter

Enables/disables VANC service filtering by DID/SDID values.

enable Use this option to enable explicit, individual VANC services. Table entries with valid DID/SDID combinations are extracted from the encoder's input and copied to the transport stream output. VANC data with non-matching DID/SDID values are filtered out and discarded.

disable Use this option to disable explicit, individual services. Disabled Services are specified through DID and SDID values in the VANC table.

When this option is chosen, all VANC data are extracted from the encoder's input (instead of being filtered) and data that is 'eligible' for passthrough is copied to the MPEG output stream. See Table 9-9, "DID/SDID Value Ranges and Passthrough Behavior When Filter is Off" on page 285. The encoder handles some VANC data input directly, such as embedded audio. These VANC data might affect the generated transport stream, but they are not copied to the stream as part of the unfiltered processing.

Unrestricted Data Service (Radio Button Option 1)

DID, SDID

Use this option if you want to manually specify the Data ID (DID) and the Secondary Data ID (SDID) for the selected 'Service'. Both of these fields require HEX values as specified in SMPTE 291M-1998, 'Ancillary Data Packet and Space Formatting'.

Note: The Secondary Data ID (SDID) is ignored if the Data ID (DID) on the same service is set to 128 (decimal) or greater.

Defined Data Service (Radio Button Option 2)

Well Known DID/SDID Pair

Use this option if you are confident about the kind of VANC data that is provided in your source, but you are you are unsure about which DID and SDID values to use. When you select a drop down option, Vidiem™ populates the DID and SID values for the selected 'Service' accordingly.

Table 9-9 DID/SDID Value Ranges and Passthrough Behavior When Filter is Off

DID	SDID	Pass Through with Filter OFF	Notes
0x00	any	no	Undefined value. Both the DID and SDID designate zero as undefined in all contexts. A zero DID overrides the SDID and makes it irrelevant. Similarly, a zero SDID should not occur with any DID.
any	0x00		
0x01 0x02 0x03	n/a	no	These DID values are reserved (unused).
0x04	0x?0 0x?4 0x?8 0x?c	no	Reserved for 8-bit applications. The low-order 2 bits of the SDID must be zero; the upper 4 bits of the SDID (represented as '?') are unrestricted. The SDID value 0x00 is excluded.
0x05 0x06 0x07	n/a	no	These DID values are reserved (unused).
0x08	0x?0 0x?4 0x?8 0x?c	no	Reserved for 8-bit applications. The low-order 2 bits of the SDID must be zero; the upper 4 bits of the SDID (represented as '?') are unrestricted. The SDID value 0x00 is excluded.
0x09 0x0a 0x0b	n/a	no	These DID values are reserved (unused).

Table 9-9 DID/SDID Value Ranges and Passthrough Behavior When Filter is Off

0x0c	0x?0 0x?4 0x?8 0x?c	no	Reserved for 8-bit applications. The low-order 2 bits of the SDID must be zero; the upper 4 bits of the SDID (represented as '?') are unrestricted. The SDID value 0x00 is excluded.
0x0d 0x0e 0x0f	n/a	no	These DID values are reserved (unused).
0x10 to 0x3f	any	no	These DID/SDID values are reserved.
0x40 to 0x4f	0x01 to 0xff	yes	These DID/SDID values are registered. (0x41, 0x01): Payload identification. (0x41, 0x07): SCTE-104 splice point triggers. (0x44, 0x04): KLV-Encoder metedata (0x45, 0x01): Dolby audio metadata.
0x50 to 0x5f	0x01 to 0xff	yes	These DID/SDID values are for user applications. (0x51, 0x01): Film codes.
0x60 to 0x7f	0x01 to 0xff	yes	These DID/SDID values are registered. (0x60, 0x60): RP-188 ancillary time code. (0x61, 0x01): EIA-708-B closed captions. (0x61, 0x02): EIA-608 closed captions. (0x62, 0x01): RP-207 program description. (0x62, 0x03): RP-208 VBI data.
0x80 to 0x9f	n/a	no	These DID values are defined to ignore the SDID.
0xa0 to 0xdf	n/a	yes	These DID values are defined to ignore the SDID.
0xe0 to 0xe7	n/a	no	These DID values are defined to ignore the SDID. (0xe0 to 0xe3): 299M, HDTV, control. (0xe4 to 0xe7): 299M, HDTV, audio.
0xe8 to 0xeb	n/a	yes	These DID values are defined to ignore the SDID.
0xec to 0xef	n/a	no	These DID values are defined to ignore the SDID. (0xec to 0xef): AES control packet.
0xf0 to 0xf3	n/a	yes	These DID values are defined to ignore the SDID.
0xf4	n/a	no	These DID values are defined to ignore the SDID. (0xf4): Error detection (EDH).
0xf5 to 0xf7	n/a	yes	These DID values are defined to ignore the SDID. (0xf5): Time code.
0xf8 to 0xff	n/a	no	These DID values are defined to ignore the SDID. The following items have registered meanings, are used internally by the encoder, and should not be assigned to services: (0xf8 to 0xff): AES audio.

Related Topics

"How to Configure HD Encoder Vertical Ancillary Data (VANC) Services" on page 70.

9.3.16 Overview of KLV Metadata Processing

KLV metadata can be carried two separate ways in the transport stream. Both methods extract VANC data from DID 0x44 and SDID 0x04.

Additionally, a VANC service can be defined to filter on the DID and SDID, which would extract the metadata, combine it with other VANC services, and carry the aggregate VANC services in the stream. This aggregate data stream's rate is controlled by the VANC rate (Total VANC Data Rate (Kbps)). Either or both methods can be used to extract KLV metadata, resulting in zero, one, or two copies of the metadata in the transport stream. See DID Filtering (Section 9.3.15, "Config > Encoder > VANC Data > VANC Services Dialog" on page 285) for details about how to select what input data to transfer or discard.

This configured metadata rate is divided by the video frame rate to determine the data limit per frame. Data are extracted from the input and copied to the output, up to the limit of the current frame. Any additional data are dropped, potentially causing an alarm (VANC Degrade - VANC Error).

KLV-Related Standards

The following standards describe and specify KLV metadata:

- RP 214-2002, SMPTE Recommended Practice, Packing KLV Encoded Metadata and Data Essence into SMPTE 291M Ancillary Data Packets.
- RP 217-2001, SMPTE Recommended Practice, Non-synchronized Mapping of KLV Packets into MPEG-2 Systems Streams.
- SMPTE 336M-2001, SMPTE Standard, for Television---Data Encoding Protocol using Key-Length-Value.
- MISB RP 0605.01, Motion Imagery Standards Board Recommended Practice, Inserting Time Code and Metadata in High Definition Uncompressed Video.

9.3.17 Config > Encoder > VBI Lines Dialog

Use this dialog to configure VBI override and Test Pattern settings.

Entries

Provides a list of all possible VBI lines in each field for any resolution. Highlight any VBI line entry to view or modify its settings.

The following table displays the VBI lines that are active for any given resolution. Look up the resolution setting for this program and check the following table for available VBI line ranges.

Table 9-10 Active Lines Per Field according to Resolution

Resolution Setting	Field	Line Number in VBI Table	Corresponding Line Number in Video Frame
Extended 720 (NTSC) or Standard 720 (NTSC)	Field 1	10 to 22	10 to 22
	Field 2	10 to 22	273 to 285
Standard 576 (PAL) or Extended 608 (PAL)	Field 1	6 to 23	6 to 23
	Field 2	5 to 22	318 to 335

Note: Settings for VBI lines that are not available in the specified resolution are ignored.

Control

Encoder Teletext Mode

Specifies how to transmit DVB teletext for all VBI lines configured as WST. Two standards govern the format of DVB teletext, EN-301-775and EN-300-472. Although EN-301-775 supersedes the earlier EN-300-472, some receivers were manufactured before the newer standard was available. Consequently, they are unable to decode the newer teletext format in EN-301-775.

dual Transmit System B Teletext in both a separate PES and in a new PES combined with other VBI information. This mode supports systems broadcasting to a population with old decoders conforming to EN-300-472 and new decoders conforming to EN-301-775. This mode requires twice as much bandwidth within the transport stream to support teletext.

en-300-472 Transmit System B Teletext in a separate PES, as described in EN-300-472. EN-300-472: Specification for conveying ITU-R System B Teletext in DVB bit streams (1997);

en-301-775 Transmit System B Teletext combined in the same PES with other VBI information, as described in EN-301-775. EN-301-775: Specification for the carriage of Vertical Blanking Information (VBI) data in DVB bit streams (2000).

Lines

Function

Use this control to choose the type of VBI line data the encoder should add on the specified line and field.

Note: Options available to this control are governed by the SI/PSI mode setting. See "SI/PSI Mode Table Transmission Rates and Other Parameter Constraints" on page 259.

amol-48, amol-96 Specifies this line should carry an AMOL waveform (Automated Measurement of Lineups), as specified by ANSI/CEA-2020, Other VBI Waveforms, December 2007. The encoder extracts the AMOL data from this line (typically line 20 or 22) of the input video, decodes that according to ANSI/CEA-2020, and transmits it through the MPEG stream.

The two values specify 48 bits/line and 96 bits/line, using a waveform appropriate for the indicated bit coding. The values can be combined on different lines and/or fields.

closedCaption Specifies this line should carry closed caption data. That is, the encoder extracts the closed caption data from this line (typically line 21) of the input video, decodes that according to EIA-608, and transmits it through the MPEG stream according to EIA-708.

Typically, this value would be used for standards NTSC and NTSC-J and would be specified only to VBI line 21 (in both fields). Nonetheless, the encoder does not treat this value as a special case. It will do its best to process closed captions on whatever lines are configured.

A digital input stream can carry closed captions in its vertical ancillary data. Encoders that support closed caption processing (indicated by having the feature-enc-vbi feature bit) can elect to use the VANC data for closed captions. See Closed Captions for additional information.

dvitc This directs the encoder to extract Digital Vertical Interval Time Code from the specified VBI lines. The time codes are then transmitted in the MPEG stream according to ETSI EN 301 775 (a private extension). Typically, DVITC is carried on line 14, but it can appear on other VBI lines.

lossless Monochrome sample data coding can be used to transmit 4:2:2 data without chrominance. See ETSI EN 301 775 V1.1.1, section 4.8. A program in DVB mode has constraints on using this function.

none Specifies no VBI data for this line.

testPattern The encoder puts data in the MPEG stream telling the decoder to insert a specific test pattern on this VBI line. If the decoder's override is configured to none, it will insert the specified test pattern in the corresponding line of the output.

wss This value directs the encoder to extract Wide Screen Signaling (WSS) from the specified VBI line, as defined by ETSI standard EN 300 294. The WSS data is transmitted in the MPEG stream according to ETSC EN 301 775. For standard video signals, WSS appears on field 1, line 23. Use of this function value on other lines is discouraged.

If WSS is successfully extracted from field 1, line 23, and the program's SI-PSI mode is other than MPEG, and the video aspect ratio is either auto-4x3 or auto-16x9, then bits b0, b1, and b2 of data group 1 will be used to set the aspect ratio and Active Format Description (AFD) of the video in the MPEG stream. This information can be used by a decoder to insert video index information in the output signal.

wst This value specifies World System Teletext. The transmission format can be configured to conform to ETSI EN-300-472, to ETSI EN-301-775, or to both standards. These standards allow the following lines to be encoded: 7 to 22 and 320 to 335, corresponding to VBI line indexes 7 to 22 in both field 1 and 2. The standards list lines outside this range as undefined or reserved. Consequently, the wst function should be specified only for lines 7 to 22 in either field. The encoder ignores wst outside this range (treats the function as none).

Depending on the closed caption source, some encoders can alternatively receive closed captions over ethernet. Only one source is active per encoder. If the encoder is not configured to use VBI lines as the closed caption source (the CC source is not {vbi}), it discards the data for VBI lines configured with the closedCaption function. Additionally, setting the CC source to {udp} overrides the line 21 function in both fields, using the same processing as {none}, regardless of the actual configured value.

VBI lines contribute data to the MPEG stream. That bandwidth must be considered when setting a program's total rate. Generally, lines with the same function share overhead. The following table uses num_lines to represent the number of lines configured to the given function per frame. The formulas conservatively use 30 frames/second, which is no slower than any actual video frame rate. This avoids underestimating the required bandwidth.

Test Pattern

Use this control to select the test pattern the decoder should provide in the selected field and on the selected line.

9.3.18 Config > Encoder > VBI Teletext Dialog

Language Code

Specifies the teletext descriptor's ISO Language Code. Following ETSI EN 300 468, Enhanced Teletext specification, entries in the ttxDesc table specify descriptors that are inserted into the Program Map Table (PMT) for this program.

This variable corresponds to the ISO_639_language_code field of the teletext descriptor, conforming to ISO 639.2/B or ISO 639.2/T.

See the teletext descriptor type for additional information.

This control also accepts text input, so any other ISO-639-2-compliant country code may be entered as well.

Page Number

Specifies the teletext descriptor page number. Values must be in Hex 00 to ff (0 to 255, represented as 2 hexadecimal digits). Following ETSI EN 300 468, Enhanced Teletext specification, entries in the ttxDesc table specify descriptors that are inserted into the Program Map Table for this program.

This variable corresponds to the teletext_page_number field of the teletext descriptor.

See the teletext descriptor type (below) for additional information.

Magazine Number

Specifies the teletext descriptor magazine number which ranges form 1 to 8. Following ETSI EN 300 468, Enhanced Teletext specification, entries in the ttxDesc table specify descriptors that are inserted into the Program Map Table (PMT) for this program.

This variable corresponds to the teletext_magazine_number field of the teletext descriptor.

See the teletext descriptor type for additional information.

Type

Specifies the teletext descriptor type. Following ETSI EN 300 468, Enhanced Teletext specification, entries in the ttxDesc table specify descriptors that are inserted into the Program Map Table for this program.

This variable corresponds to the teletext_type field of the teletext descriptor, described by ETSI EN 300 468, Table 70.

Table 9-11 Teletext Descriptor Types Table

Value	Description
0x00	Reserved for future use.
0x01	Initial teletext page.
0x02	Teletext subtitle page.
0x03	Additional information page.
0x04	Program schedule page.
0x05	Teletext subtitle page for hearing impaired people.
0x06 to 0x1f	Reserved for future use.

Note: Hex values in the first column above are not shown in Vidiem™, but they are used in the table.

As a reserved value, zero serves as a special marker for the entire descriptor. If the type is zero, the encoder does not insert the descriptor into the MPEG stream. Even when the type is non-zero, the encoder inserts a descriptor only when the program stream actually carries teletext data.

A program's SI-PSI mode must be set to DVB to carry teletext correctly. Other values of the SI-PSI mode suppress both teletext and the teletext descriptors.

9.4 Encoder Status

9.4.1 Status > Encoders Table

Video Input
Indicates this encoder's video input source.

Video LOS
Indicates if this encoder is experiencing a video LOS.

Video Rate (Mbps)
Indicates the ongoing, one-second average bit rate of the video elementary stream.

VANC Data Rate (Mbps)
Indicates the peak bit rate for vertical ancillary data.

KLV Rate
Indicates the peak bit rate for KLV data.

VBI Error Status
Indicates 'Fault' if the encoder experiences excessive VBI errors.

9.4.1.1 LEDs
Indicates the state of each of the encoder's LEDs.

9.4.2 Status > Encoding Channel Branch

Click a tab on the right side of the screen to view groups of status parameters for this decoding channel.
With any tab selected, press F1 for help on items in that group.

9.4.3 Status > Encoder > Program Tab

Data Received
Provides a count of data bytes received.

Data Dropped
Provides a count of dropped data bytes.

9.4.4 Status > Encoder > Video Tab

Closed Caption Count
Indicates the count of closed caption characters extracted from the input (regardless of source) and inserted into the stream.

Video Input
Indicates this encoder's video input source.

Video LOS
Indicates if this encoder is experiencing a video LOS.

Video Rate (Mbps)
Indicates the ongoing, one-second average bit rate of the video elementary stream.

Sync Errors
Indicates the sync error count. The count increments when the start of frame is not found at the expected time for three consecutive frames.

VBI Error Status
Indicates 'Fault' if the encoder experiences excessive VBI errors.

Video Index (VI) Present
Indicates whether the video index (VI) information is present in the video. When present, this information specifies the aspect ratio of the video, letting the system insert an appropriate Active Format Description (AFD).
A standard definition encoder's SDI input signal can carry VI. If the configured input signal is sdi-*, the input is present, locked, and standard definition, and the SDI stream carries VI information, the VI status will report present. Otherwise the module will report 'notPresent'.

EDH Present

Indicates the presence of EDH errors in incoming video.

EDH Line Errors
Provides a count of EDH line errors.

EDH Path Errors
Provides a count of EDH path errors.

VANC Data Rate (Kbps)

Indicates the peak bit rate for vertical ancillary data.

Packets Dropped

Provides a count of the number of VANC packets dropped.

KLV Metadata Rate

Provides status on the actual KLV Metadata Rate.

KLV Packets Dropped

Indicates the dropped packet count for KLV-encoded metadata.

If the actual incoming metadata exceeds the configured KLV-encoded metadata rate, the encoder can drop data from the stream. The dropped packet count accumulates in this status variable.

Note that metadata processed as a VANC service and policed by the VANC rate would be counted in the VANC dropped packet count.

If the module drops KLV-encoded metadata packets, it will declare an alarm (vancDeg, VANC error). The utility clear command resets this value to zero.

OP-47 Peak Lines/Frame

Indicates the peak OP-47 teletext lines/frame in the last few seconds. This value gives the high watermark of the independent OP-47 teletext subtitling, inserted into the encoder's transport stream output. This does not include subtitling extracted as a VANC service, using the VANC DID filter.

If the actual incoming teletext exceeds the configured OP-47 line limit, the encoder can drop data from the stream. The resulting OP-47 peak line count status reflects only data put into the output transport stream.

OP-47 Peak Lines Dropped

Indicates the dropped line count for OP-47 subtitling.

If the actual incoming teletext subtitling exceeds the configured OP-47 line count, the encoder can drop data from the stream. The dropped line count accumulates in this status variable.

Note that OP-47 subtitling processed as a VANC service and policed by the VANC rate would be counted in the VANC dropped packet count.

If the module drops OP-47 lines, it will declare an alarm (vancDeg, VANC error). The utility clear command resets this value to zero.

9.4.5 Status > Encoder > Audio Tab

This table lists current audio settings for both the primary and secondary audio channels.
Double click any row to open an Audio dialog and change settings.

Audio Input

Indicates if the audio input is analog or digital.

AV Sync Adjust

Indicates the audio/video sync adjustment count. When the audio and video streams have different time bases, they can drift apart over time. When their relative timing difference becomes too large, the encoder adjusts its internal timing to bring them into agreement. This condition doesn't necessarily mean either audio or video has errors; but the lack of synchronization can be an important diagnostic for some applications.

When an encoder receives a new configuration or reacquires its audio/video, it can increment this value when synchronizing the inputs.

In some cases, the encoder might not have video input, or it might derive its time base from an input other than video. This counter actually applies to audio synchronization adjustments relative to the time base. Video normally supplies that time base, but some exceptions exist.

Digital Audio LOS

Indicates an audio LOS on either audio channel.

CRC Errors

Provides a count of CRC errors on the input audio signal.

Digital Audio LOS

Indicates loss of signal fault. This variable applies only to digital inputs and indicates a loss of framing (AES or SDI).

Format Supported

Indicates if the encoder does not support the format of the current audio input. A fault here may be due to a mis-configuration of the rate relative to the encoding standard or some other mismatch.

Embedded Audio Present

Indicates if embedded audio is present in the input video signal.

Embed Group

Identifies embedded audio group used if the audio input above is set to 'embedded'. This setting is displayed whether embedded audio input is used or not.

Embed Channel

Identifies embedded audio channel used if the audio input above is set to 'embedded'. This setting is displayed whether embedded audio input is used or not.

9.4.6 Status > Encoder > Splice Log Tab

Abstract: *This table provides a list of details about recent splice point insertion events.*

9.4.7 Status > Encoder > VANC Data Tab

Abstract: *This table provides a summary of vertical ancillary data (VANC) settings for each service.*

9.4.8 Status > Encoder > VBI Lines Tab

Abstract: *This table provides a summary of VBI test pattern and function settings listed by field and line.*

Chapter 10: NetVX Decoder Module

Configuration and Status Dialogs

10

10.1 Decoder Configuration

This section describes the decoder's various configuration dialogs.

10.1.1 Config > Decoders Table

Abstract: *The 'Decoders' branch of the navigation tree contains a sub-branch for each decoder module.*

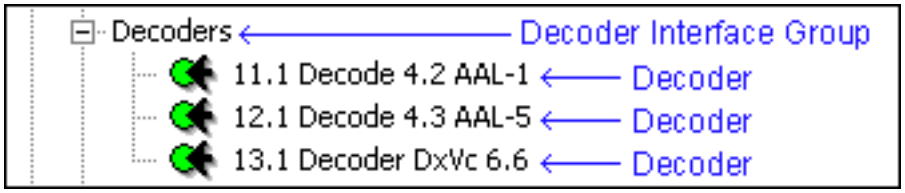


Figure 10-1 The Decoders Branch of Vidiem™'s Navigation Tree

Each decoder operates directly as a cross connection destination. Therefore, unlike ATM and IP modules, you do not need to create a VC on a decoder to cross connect a signal from another module to it. See Section 3 "NetVX Configuration Procedures" on page 146 for details on how to connect a signal from another module to a decoder.

For details about the colored icons shown in the navigation tree above, see the topic "Overview of Navigation Tree Icons" on page 180.

Tag

This row indicates the tag assigned to each decoder.

Standard

This row indicates the video standard for each decoder.

Program Number

This row indicates the number of the program handled by each decoder. This number is the number of the program in the MPEG-2 Program Allocation Table (PAT). The value zero indicates that the decoder is configured to decode the first program it finds in the stream during an ascending search.

10.2 Decoding Channel Branch

Click a tab on the right side of the screen to view groups of configuration parameters for this decoding channel. With any tab selected, press F1 for help on items in that group.

Double click any table cell, in any tab, to open the related configuration dialog.

10.2.1 Config > Decoder > Program Tab

Tag

Indicates the tag assigned to the selected decoder.

Decoder Degrade

Indicates if the decoder is configured to report degrade alarms.

Data Services

VBI Degrade

Indicates if the decoder is configured to report VBI degrade alarms.

Video Index

Indicates if the video index is set to 'automatic' or 'none'.

BISS Identifiers

BISS ESW

This value is hidden. The presence of asterisks in this field does not mean that the value is set.

BISS SW

This value is hidden. The presence of asterisks in this field does not mean that the value is set.

10.2.2 Config > Decoder > Video Tab

Standard

Indicates the specified video decoding standard.

No Input

Indicate the current setting for decoder behavior when input is not present.

Black	The decoder generates sync and displays a black screen.
NoSync	The decoder stops generating a sync signal.
OSDStatus	The decoder presents the OSD status display regardless of whether or not it was enabled.
Still	The decoder displays the last picture successfully decoded. The decoder displays black if no picture is available.

Vertical Offset

Indicates the vertical offset setting for start of active video.

-2	Encoded video begins on line 20. This setting makes the image on a monitor shift upward two lines from the default.
-1	Encoded video begins on line 21. This setting makes the image on a monitor shift upward one line from the default.
0	Encoded video begins on line 22. This setting is the default.
1	Encoded video begins on line 23. This setting makes the image on a monitor shift down one line from the default.
2	Encoded video begins on line 24. This setting makes the image on a monitor shift down two lines from the default.

Router

Use these controls to set configuration parameters to support redundant decoder modules. See the topic "Transmit Interface Router Settings" on page 458 for details.

On Screen Display

Indicates if the on-screen display (OSD) is enabled.

OSD Program Name

Indicates if the OSD display includes the encoder's program name.

OSD Program Status

Indicates if the OSD program status display is enabled.

OSD Test Pattern

Indicates the test pattern selected for the OSD display. The OSD test pattern obscures all other OSD information when enabled.

OSD Text

Indicates the text string for the program name in the OSD display.

10.2.3 Config > Decoder > Audio Tab

Source

Specifies the audio decoder's source.

Delay

Specifies the delay (aka. lip sync) setting for this audio decoder.

Pass Through

Specifies whether the decoder should pass through the compressed audio signal or decode it.

Enabled Indicates the audio signal should be passed through.

Disabled The audio signal should be decoded.

Router

Use these controls to set configuration parameters to support redundant decoder modules. See the topic "Transmit Interface Router Settings" on page 458 for details.

10.2.4 Config > Decoder > Control Tab

Abstract: *This tab displays the current association status of the audio channel selected in the configuration tree.*

Function

Specifies the mode of operation for this auxiliary audio channel. The NetVX's database maintains encoder and decoder branches for each auxiliary audio channel. Parameters in both of these branches can be modified at any time regardless of the this parameter's setting.

off Disables this auxiliary audio channel for operation.

encode Enables this auxiliary audio codec to operate as an encoder.

decode Enables this auxiliary audio channel to operate as a decoder.

Association Mode

Indicates the mode of operation for the channel selected in the navigation tree.

associated This mode associates the auxiliary audio channel with another encoder or decoder (depending on the function). The associated slot identifies an encoder or decoder that 'inherits' the auxiliary facilities.

For example, suppose the function configures this auxiliary audio channel as an encoder, and the associated slot and channel are set to 5 and 1. Slot 5 should contain an encoder. This auxiliary processor's audio channel will augment the encoder's own audio set, with appropriate updates to the transport stream (the PMT, etc.).

standalone This mode directs this auxiliary audio channel to operate as an independent encoder or decoder (depending on the function). As an encoder, the channel generates a complete single program transport stream, carrying only audio. It may be cross-connected to any destination that consumes MPEG. Likewise, a decoder channel accepts a (single- or multi-program) transport stream as input, selects one audio stream from the designated program, and decodes that audio stream.

Associated Slot

This field indicates if the audio channel is associated with another module.

0 Indicates this audio channel is not associated with any slot.

Non-zero Indicates the slot with which this audio channel is associated.

10.2.5 Config > Decoder > VBI Lines Tab

Indicates the current VBI line configuration.

- Click the plus signs in the boxes next to each field name to expand the list and see all entries.
- In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

10.3 Decoder Dialogs

10.3.1 Config > Decoder > Program Dialog

Program

Tag

Use this field to name this decoding channel. The tag may be up to 31 characters long.

Enable Reference

Specifies the reference signal operation. Given a composite reference input, the decoder can synchronize its output to the reference signal. This can be useful in a studio to enable frame-accurate operations.

When the decoder is using the system's reference signal, the frame rates for its configured video standard, the reference signal, and the incoming MPEG stream should match. If the values do not match (such as a PAL reference signal combined with NTSC output video), the decoder will assert an alarm (MPEG Decoder Degrade - Video Decode Errors). If this decoder is not using the reference signal (off), only the video standard and the MPEG stream must match.

To synchronize its output with the reference signal, a decoder must occasionally skip or repeat frames. This does not work when the decoder passes compressed audio without decoding it. Consequently, audio passthrough and the reference signal should not be enabled at the same time. The decoder asserts an alarm (Module Degrade - Configuration Error) if it encounters this mis-configuration.

on	The decoder locks its output to the system's reference signal. It can skip or repeat frames as needed to maintain synchronization between its generated output and the reference signal.
off	The decoder ignores the system's reference signal. It generates output based solely on its MPEG input, without repeating or skipping frames.

Program Number

Identifies the number of the program this decoder should decode.

First in Stream	Decode the first program listed in the MPEG-2 transport stream's Program Allocation Table (PAT).
1 to 65535	Specifies the program to decode.

10.3.2 Config > Decoder > Program > Control Monitoring Dialog

Alarms

Enable Decoder Degrade

Check this box to enable decoder degrade alarms. All alarms and alarm categories are listed in the topic "Overview of NetVX Alarms" on page 214.

Router

Use these controls to configure router settings to support ATM module output redundancy. See "Transmit Interface Router Settings" on page 458 for details.

10.3.3 Config > Decoder > Program > Descrambling Dialog

Descrambler Session Word

Select the option that reflects the scrambling mode used in your system.

No Change Choose this option to decode unencrypted MPEG-2 transport streams.

BISS Mode 1 Choose this option to decode MPEG-2 transport streams encrypted using BISS Mode 1.
BISS Mode 1 requires a 'Clear Session Word'. Enter this string in the entry box provided.

BISS Mode E Choose this option to decode MPEG-2 transport streams encrypted using BISS Mode E.
BISS Mode E requires both an 'Encrypted Session Word' and an 'Injected Identifier'.
Enter the 'Encrypted Session Word' in the entry box provided.
Press the 'New' button at the bottom of the screen to open the 'Injected Identifier' dialog and to enter that information. See "Config > Decoder > Program > Descrambling Injected Identifier Dialog" on page 303 for details.

BISS Mode E

Injected Identifier

This field displays the decoder Injected Identifier.

New (button)

Click this button to open the 'Injected Identifier' dialog and enter a new Injected Identifier.

Related Topics

- "Tools > BISS Keys Dialog" on page 56.
- "Tools > BISS Keys > New (button) > BISS Descrambler Dialog" on page 57.
- "Config > Encoder > Program > Scrambling Dialog" on page 261.
- "Config > Decoder > Program > Descrambling Injected Identifier Dialog" on page 303.

10.3.4 Config > Decoder > Program > Descrambling Injected Identifier Dialog

Injected Identifier

Enter the 14-character Injected Identifier in this text box, or press the 'New' button (below) to have Vidiem™ create new Injected Identifier.

New (button)

Click this button to cause Vidiem™ to generate a new Injected Identifier.

Include in the Global Descrambler List

Check this box to cause the Injected Identifier to appear in the Global Descrambler list. Choose 'Tools > BISS Keys' to open the 'BISS Keys' dialog (See "Tools > BISS Keys Dialog" on page 56). This dialog includes the Global Descramblers list.

Related Topics

- "Tools > BISS Keys Dialog" on page 56.
- "Tools > BISS Keys > New (button) > BISS Descrambler Dialog" on page 57.
- "Config > Encoder > Program > Scrambling Dialog" on page 261.
- "Config > Decoder > Program > Descrambling Dialog" on page 302.

10.3.5 Config > Decoder > Video Dialog

Note: The ability to decode 4:2:2 is governed by the "System and Module Types and Keyed Features" on page 472.

Input/Output

Standard

Use this control to identify the standard of incoming video.

Aspect Ratio

Specifies the output video monitor aspect ratio. Depending on video capture equipment (cameras, format converters, encoders, etc.), a video stream has a 'natural' aspect ratio. Though not required, this value can be indicated in the MPEG stream to help display the video without distortion. The decoder's aspect ratio value specifies the output monitor's aspect ratio, allowing the decoder to adapt the input video to the display device.

4x3 The monitor's aspect ratio is 4x3. If the input image is 16x9 it will appear distorted.

16x9 The monitor's aspect ratio is 16x9. If the input image is 4x3, all lines are displayed but their edges are trimmed.

unknown The monitor's aspect ratio is unspecified. The image is not converted in any way. The image's appearance depends on the input and the physical monitor. However this selection should be used if the received signal is PAL format and contains WSS on line 23. In this case the material will be presented by the monitor as intended.

No Input

This control sets the decoder's behavior upon a loss of signal.

Black The decoder generates sync signals and displays a black screen.

No Sync The decoder stops generating sync signals.

OSD Status The decoder displays the OSD status, regardless of whether the On Screen Display was previously enabled.

Still The decoder displays the last picture it successfully decoded. If no picture is available, it shows black. If the decoder is disabled, it also shows black.

The decoder's configured video standard affects its behavior on loss of input.

The decoder attempts to continue generating the same output video format as when it lost its input signal. If the video standard is set to auto, the decoder uses the last video format it detected. If the decoder had failed to detect the format, it uses NTSC in auto mode.

Vertical Offset (lines)

Specifies the decoder's vertical display line offset. The offset vertically shifts the lines on which the decoder starts field 1 and field 2 in the video output.

-2 to -1 Shifts lines up by the specified offset amount.

0 No vertical offset; does not shift video.

1 to 2 Shifts lines down by the specified offset amount.

The following table indicates the default location at which the decoder puts active video for each resolution.

Table 10-1 Active Video Lines in NTSC and PAL Formats

Format	Coded Lines	
	Field 1	Field 2
NTSC Standard (480 lines)	22 to 261	285 to 524
NTSC Extended (512 lines)	7 to 262	270 to 525
PAL Standard (576 lines)	23 to 210	336 to 623
PAL Extended (608 lines)	7 to 310	336 to 623

On Screen Display (checkbox)

Check this box to enable the decoder's on-screen displays.

Enable Program Name

Check this control to enable the decoder to display the encoder's program name in the OSD status.

Text

Use this field to enter a text string of up to 31 characters. If this field is not empty, the OSD status display shows this string on one of its pages.

Enable Program Status

Check this box to enable the decoder's on-screen input status display. The status display presents a variety of details about the incoming program. This information in this display is useful when wiring feeds to the decoder and when configuring encoding sources.

Test Pattern

Use this control to select a full-screen test pattern for the decoder to display.

Note: This OSD test pattern obscures all other OSD information when enabled.

10.3.6 Config > Decoder > Audio Properties Dialog

Input/Output

Channel

Specifies which audio channel (PMT entry) in the transport stream this audio decoder should decode.

0	The decoder selects the audio channel in the PMT that this audio decoder should decode.
1 to 65535	Decodes the audio channel matching the specified PMT audio entry.

Note: (1) Each audio decoder must decode a unique audio channel.
(2) The specified audio channel must exist in the transport stream. For example, if the selected PMT entry is 3, the PMT should contain at least 3 audio entries.
(4) The decoder declares an alarm (audDeg, no audio) if any of the above constraints are violated.

Source

Indicates the input source for this audio.

Note: Availability of the 'Stream' option is governed by feature keying. See "DEC Module Types and Features" on page 480 for details.

Stream	The decoder takes its audio input from the incoming MPEG stream.
Mute	The decoder provides silent audio output. If the decoder module is disabled, the decoder mutes all audio output, regardless of the actual configuration values.
Tone Left	The decoder inserts a standard tone onto the left channel of the stereo pair and uses the stream input for right channel.
Tone Right	The decoder inserts a standard tone onto the right channel of the stereo pair and uses the stream input for left channel.
Tone Both	The decoder inserts a standard tone onto the left and right channels of the stereo pair output. The decoder ignores audio input from the MPEG stream.

Enable Pass Through

Check this box to cause the decoder to pass encoded audio out the digital audio interface rather than decode it internally. This option is provided for system configurations using external equipment to decode audio.

Delay (ms)

This control specifies the amount of audio delay (in milliseconds) that the decoder should apply to this audio signal relative to video. This setting is also known as 'lip sync delay'.

Analog Output Level

Specifies the full-scale analog output level. When generating analog audio, the decoder uses one of the following output levels.

10.3.7 Config > Decoder > VBI Lines Dialog

Entries

Provides a list of VBI lines in each frame and field. Highlight any VBI line entry to view or to modify its settings.

Overall VBI Degrade

Enable VBI Degrade

Check this box to enable VBI Degrade Alarms. All alarms and alarm categories are listed in the topic "Overview of NetVX Alarms" on page 214.

Video Index

Specifies the handling of video index information. When the transport stream carries aspect ratio information, the decoder can use that information to insert video index information into the output signal.

auto The decoder extracts data from the transport stream to reconstruct the video index: an active format descriptor (if present) and the aspect ratio from the picture header. Depending on the output video standard, video index information is inserted on VBI line 14 for NTSC or line 11 for PAL.

none This value disables video index reconstruction in the output signal. An encoder can use any of the following sources for this information (1) Wide screen signaling from VBI lines. (2) Video index from the input signal. (3) Configured aspect ratio.

After processing an input signal, the encoder would construct the transport stream with an aspect ratio in the picture header and (perhaps) an active format descriptor. The decoder uses that information to guide its video index insertion.

Note: The decoder cannot currently reconstruct a VBI line with coded video and simultaneously insert video index information. To preserve the coded video, select 'none' to disable video index insertion. Otherwise, the decoder inserts a black VBI line carrying video index information.

Override

Use this control to select how the decoder should treat incoming VBI line data for the specified line and field.

Note: The availability of VBI override is governed by feature keying. See "DEC Module Types and Features" on page 480 for details.

None No VBI line override. The decoder inserts VBI data from the encoder on this line.

Black The decoder ignores data sent by the encoder and inserts black on this VBI line.

C*oded ** Insert decoded MPEG video on this VBI line. If the encoded MPEG video signal does not contain this VBI line, the decoder uses black. A NetVX encoder would need to be using an 'Extended 720 Resolution' to put video VBI lines in the stream.

Note: The encoder must use extended resolution to put video VBI lines in the stream.

Test Pattern The decoder ignores data sent by the encoder and inserts the test pattern (selected below).

Test Pattern

Specifies a test pattern to insert on the specified field and line VBI processing. This setting requires the Override control (above) to be set to 'test pattern'.

10.4 Decoder Status

10.4.1 Status > Decoders Table

This table displays basic information for each decoder in the system.

Program Name

This field indicates the program name configured on the encoder, and is presented here for convenience.

Program Present

This row Indicates 'Not Present' when the decoder can not decode at least one of the program's audio or video PIDs. 'Unknown' is displayed when the decoder is presenting a test pattern.

Transport Stream Present

This field indicates if a transport stream is present in the incoming signal.

Transport Stream Rate (Mbps)

This field indicates the total rate used by this program.

Video Present

This field i indicates whether or not the video elementary stream is present in the incoming transport stream.

VBI Error Status

Indicates the fault condition for excessive errors.

LEDs

Module LED

This field indicates the state of the decoder module's LED.

10.4.2 Status > Decoding Channel Branch

Click a tab on the right side of the screen to view groups of status parameters for this decoding channel.
With any tab selected, press F1 for help on items in that group.

10.4.3 Status > Decoder > Program Tab

This table provides information concerning the overall incoming MPEG-2 program.

Program Name

The program name is configured on the encoder and is presented here for convenience.

Program Present

Indicates 'not present' when the decoder can no longer decode at least one of the program's audio or video PIDs.

Continuity Count Error Status

Provides a count of continuity errors on all PIDs in the transport stream.

Transport Stream Errors

Maintains a count of errors received in the incoming transport stream.

Transport Stream Present
Indicates if a transport stream is present in the incoming signal.

Transport Stream Rate (Mbps)
Indicates the total rate for this program.

VBI Error Status
Indicates 'Fault' if the decoder experiences excessive VBI errors.

10.4.4 Status > Decoder > Video Tab

This table provides information concerning the video component of the incoming MPEG-2 program.

Decoding Errors
Maintains a count of video frames received with errors.

Frame Rate
Detects and presents the frame rate of incoming video.

MPEG Profile
Indicates the profile (4:2:2 or 4:2:0) of incoming video.

Horizontal/Vertical Resolution
Indicates the resolution of the incoming video signal.

Video Present
Indicates whether or not video is present in the incoming transport stream.

10.4.5 Status > Decoder > Audio Tab

This table provides information concerning the audio component of the incoming MPEG-2 program.

Audio Present
Indicates the presence of audio on each audio decoding channel.

Decoding Errors
Maintains a count of errors in each channel's audio signal.

Standard
Indicates the standard of the incoming audio on each channel if determinable.

10.4.6 Status > Decoder > VBI Lines Tab

This table indicates the test pattern and function of each VBI service present in the decoder's video input.

Chapter 11: NetVX TMX Module
Configuration and Status Dialogs

11

11.1 TS Receivers Configuration

11.1.1 Config > TS Receivers Table

Abstract: *The two branches under the TS Receivers branch each represent one of the TMX module's two physical (ASI/310M) receive interfaces.*

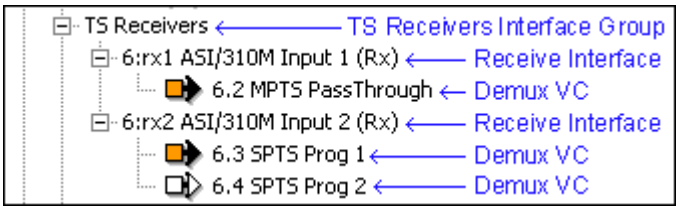


Figure 11-1 The TS Receivers Branch of the Navigation Tree

Each interface can receive a multi-program transport stream from external equipment. Multi-program transport stream input from each TS Receiver may be either passed through 'wholesale' to a single Demux VC, or de-multiplexed and each program routed to a separate Demux VC. Each Demux VC's, in turn, can operate as cross connection source.

For details about the colored icons shown in the navigation tree above, see the topic "Overview of Navigation Tree Icons" on page 180.

Note: TMX's TS Receiver interfaces availability is governed by feature keying. See "TMX Module Types and Features" on page 481 for details.

Table Entries...

Mode

This field indicates the mode in which the interface is configured to operate.

Pass Through

This field indicates whether the interface is configured to pass through or de-multiplex the transport it receives.

Active Virtual Channels

This field indicates the number of virtual channels the interface is processing. One VC is active when the interface is configured to 'Pass Through'. Up to 63 VCs may be active when the interface's input is de-multiplexed.

Enable Network Degrade Alarms

Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms

Use this control to enable Network Fault alarm notification. See "Network Fault Alarms" on page 495 for more information.

Related Topics

- "Config > TS Receivers > Demultiplexer VC Tab" on page 314.
- "Status > TS Receivers > Interface Tab" on page 318.

11.2 TS Receivers Branch

11.2.1 Config > TS Receivers > Interface Tab

Abstract: *This table displays a column summarizing the settings of each TMX receive interface.*

Tag
This field indicates the tag assigned to this interface.

Active Virtual Channels
This field indicates the number of VCs that the respective physical interface is currently handling.

Enable Network Degrade Alarms
Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms
Use this control to enable Network Fault alarm notification. See "Network Fault Alarms" on page 495 for more information.

Transport Stream

SI-PSI Mode
This field indicates the system information table paradigm.

Input

Mode
This field indicates the mode in which this interface is configured to operate.

Pass Through
This field indicates if the respective receive interface is configured to passthrough or to demultiplex the transport stream it receives.

Receive Interface Router

These controls summarize router configuration settings. See "Receive Interface Router Settings" on page 450 for details.

11.2.2 Config > TS Receivers > Demultiplexer VC Tab

Abstract: *This table displays a row summarizing the settings of each VC associated with the selected TMX receive interface.*

VC
Indicates the VC number.

State
Indicates if the VC is active or inactive.

Interface
Indicates the demultiplexer interface that this VC is associated with.

TS Rate (Mbps)
Indicates the policing rate for this virtual channel. Data are dropped if this rate is exceeded.

Program
Specifies the program number associated with this demux VC.

Function
Indicates the function in which this VC is configured to operate.

PID
Indicates the number of the PID, in the multiplexed transport stream, form which this VC is configured to extract data (when the VC's 'Function' is set to 'PID').

Audio Filter
Displays the HEX values forming the audio PID filter.

Data Filter
Displays the HEX values forming the data PID filter.

Drop Conditional Access
Indicates if this VC is configured to drop Conditional Access (CA) information.

Enables/disables the disposal of Conditional Access (CA) data on this VC.

enable	Directs the VC to discard all CA information. Specifically, the Entitlement Control Message (ECM) stream, and any CA descriptors, referenced through the PMT.
disable	(default) Allows the VC to pass CA information intact.

VC Degrade
Indicates the state of VC degrade alarm notification on this interface.

VC Fault
Indicates the state of VC fault alarm notification on this interface.

11.3 TS Receivers Dialogs

11.3.1 Config > TS Receivers > Interface Dialog

Control

Tag
Use this control to assign a tag to this interface.

Enable Network Degrade Alarms
Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms
Use this control to enable Network Fault alarm notification. See "Network Fault Alarms" on page 495 for more information.

Transport Stream

SI-PSI Mode
Specifies the system information table paradigm.

dvb Process and preserve control tables for the Digital Video Broadcasting project. In particular, this allows the SDT on to PID 17 and forwards it through the demultiplexer.

mpeg Process and preserve only generic MPEG control tables. Tables, such as the SDT, that are specific to a particular MPEG application may be discarded.

Input Receiver Slot#.Interface#

Mode
Enables/disables the specified receive interface.

OFF Marks the interface as non-operational. Virtual channels may be associated with the interface, but those channels will carry no traffic.

Rx-Only Puts the interface into receive-only mode. To the extent possible, this value decouples the transmit and receiver interfaces.

* Availability governed by feature keying. See "TMX Module Types and Features" on page 481 for details.

Standard
Specifies the receiver interface standard. The physical interface determines what configuration values are appropriate.

asi Configures this interface to receive Asynchronous Serial Interface (ASI). The receiver automatically adapts to 188-byte or 204-byte packets.

auto Configures this interface to detect whether the input it receives is ASI or SMPTE-310M.

smpte-310M Configures this interface to receive SMPTE-310M, which runs at a fixed rate of 19.39265846 Mbps with 188-byte packets.

Note 1: TMX-* modules have independent transmit and receive hardware. The receive interface ‘Standard’ is independent from the transmitter's configuration.

Note 2: If the module is configured for external loopback, then the receiver's ‘Standard’ can alter the transmitter's configured value. The transmitter's status always indicates the standard in use.

Enable Pass Through

If checked, allows this interface to pass through the transport stream without multiplexing.

Note: Passthrough is disabled if more than one VC is configured to operate on this interface. To re-enable Passthrough, delete all but one VC and check this control.

11.3.2 Config > TS Receivers > VC Control Dialog

Abstract: *Use this dialog to create and manage one or more Demux VCs carrying the input received through the TMX-M12 module's 'IN 1' and 'IN 2' BNC connectors.*

- In passthrough mode, no more than one Demux VC may be listed in this dialog.
- In non-passthrough mode, more than one Demux VCs may be listed in this dialog.

Note: This dialog is identical to 'TS Demultiplexers Dialog'. See Section 11.11.1, "Config > TS Demultiplexers > VC Control Dialog" on page 353 for a detailed description of controls.

11.4 TS Receiver Status

11.4.1 Status > TS Receivers Table

Abstract: *This table summarizes the status for all TMX receive interfaces in the system. Each column presents status for a given interface.*

Packets

Provides a count of transport stream packets received on this interface.

TS Rate

This field indicates the computed transport stream payload bitrate on this interface. The system uses the interface's packet count and elapsed time to compute the bitrate approximately once per second.

Standard

This field indicates the MPEG standard of the incoming transport stream.

System Information Present

This field indicates if system information tables are present in the transport stream's program association table (PAT).

Loss of Frame

This field indicates a Loss of Frame (LOF) on the receive interface.

Loss of Signal

This field indicates a Loss of Signal (LOS) on the receive interface.

Errored Seconds

Provides a count of the number seconds during which this interface has experienced errors.

Line Errors

Provides a count of the number seconds during which this interface has experienced Line errors.

11.4.2 Status > TS Receivers > Interface Tab

This table is identical to the TS Receivers table except it displays only the selected receiver.

Related Topic

"Status > TS Receivers Table" on page 318

11.4.3 Status > TS Receivers > Virtual Channel Tab

Packets

Provides a count of transport stream packets received on this VC.

TS Rate

This field indicates the computed transport stream payload bitrate on this VC. The system uses the VCs packet count and elapsed time to compute the bitrate approximately once per second.

Program Present

This field indicates whether or not a program is detected as present in the incoming transport stream.

Packets Dropped

Maintains a count of the number of packets dropped by this VC.

SI-PSI Continuity Counter Errors

Maintains a count of the number of System Information continuity count errors detected in this VC.

SI-PSI CRC Errors

Maintains a count of the number of System Information CRC errors detected in this VC.

11.4.4 Status > TS Receivers > Program Tab

Program

Provides an index number for each program located in the transport stream.

Name

Indicates the name for this program, as obtained from the MPEG stream. Typically, this value is inserted by an encoder or another entity that creates transport streams.

PCR PID

Indicates the PID that carries this program's PCRs. If the program does not have PCRs, this parameter takes on the value 0x1fff.

PMT PID

Indicates the PID that carries this program's PMT. This field's interpretation depends on the program number.

When the program number is '0', this parameter indicates the network PID, thereby giving the PID of the transport stream packets containing the Network Information Table. The presence of the network PID and the NIT is optional.

When the program number is non-zero, this parameter indicates the PID of transport stream packets containing the Program Map Table.

PMT Version

Indicates the version number of this program's Program Map Table. This number changes whenever the PMT is updated.

VC

Indicates the number of the VC on which this program is located.

11.4.5 Status > TS Receivers > Program> Elementary Stream Tab

Elementary Stream PID

Indicates the elementary stream PID.

Elementary Stream Type

Indicates the elementary stream type.

11.5 TS Transmitter Configuration

11.5.1 Config > TS Transmitters Table

Abstract: *The two branches under the TS Transmitter branch each represent one of the TMX module's two physical (ASI/310M) transmit interfaces.*

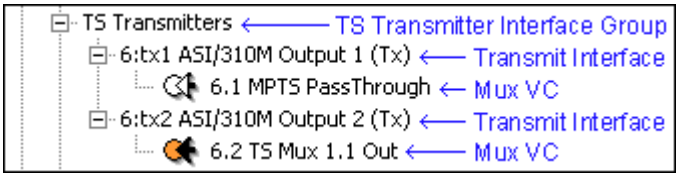


Figure 11-2 The TS Transmitters Branch of the Navigation Tree

Each TS Transmitter receives its input from between one and 63 Mux VCs. These Mux VCs operate as destinations in their respective cross connections. The TS Transmitter can either 'pass through' a single Demux VC carrying a multi-program transport stream (MPTS) or it can create a MPTS by multiplexing up to 63 Mux VCs.

In practice, several sources, such as encoders, MPEG on ATM VCs, MPEG on IP VCs, etc. can be cross-connected to Mux VCs on a TS Transmitter interface and multiplexed into a single ASI or 310M MPTS. This MPTS can then be made available to external equipment on the TMX's TX interface.

The table on the right side of the screen provides the following information about each TS Transmitter interface.

Note: For details about the colored icons shown in the navigation tree above, see the topic "Overview of Navigation Tree Icons" on page 180.

Mode

This field indicates the mode that the selected interface is configured to operate in.

Standard

This field indicates the interface's standard of operation. This standard may be either ASI or SMPTE 310M.

TS Rate

This field indicates the rate at which this interface is configured to operate.

Pass Through

This field indicates if the interface is operating in pass-through mode.

Active Virtual Channels

This field indicates the number of active virtual channels operating on this interface.

Active Bandwidth

This field indicates the amount of bandwidth on this interface that is currently in use.

Available Bandwidth

This field indicates the amount of bandwidth that this interface is configured to provide.

Data Carousel Streaming

This field indicates if the data carousel is configured to stream through this interface.

Data Carousel Rate

This field indicates maximum bit rate available to this interface's data carousel.

Enable Network Degrade Alarms

Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms

Use this control to enable Network Fault alarm notification. See "Network Fault Alarms" on page 495 for more information.

11.6 TS Transmitter Branch

11.6.1 Config > TS Transmitter > Interface Tab

This table displays a column summarizing each TMX-M12 transmit interface.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

11.6.2 Config > TS Transmitter > Multiplexer VC Tab

Abstract: *This table provides a row for each VC configured on the selected Multiplexer Interface, and a column for each VC parameter.*

Double-click the white area of any row to open the 'TS Transmitter Properties' page to the 'VC Control' dialog for the selected VC.

11.6.3 Config > TS Transmitter > Interface Dialog

Note: The availability of the TMX's TS Transmitter interfaces is governed by feature keying. See "TMX Module Types and Features" on page 481 for details.

Control

Tag

Use this field to enter a descriptive tag uniquely distinguishing this virtual channel. The tag may be up to 31 characters long.

Enable Network Degrade Alarms

Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms

Use this control to enable Network Fault alarm notification. See "Network Fault Alarms" on page 495 for more information.

Data Carousel Rate

Specify the data carousel rate here. If this entry box is greyed-out, then check the adjacent 'Enable Data Carousel Streaming' to enable it.

Enable Data Carousel Streaming

Check this box to enable carousel streaming on this interface. Checking this box enables the Data Carousel Rate (described above) to be set. See "How to Configure Carousel Directories and Files" on page 125 for details.

Output Transmitter (Slot#.Channel)

Mode

Enables/disables the specified receive interface.

Link-1	Choose this option cause this interface to draw it's signal from TX interface 1. Available on either the TMX-M12 or the TMX-M14.
Link-2	Choose this option cause this interface to draw it's signal from TX interface 2. Available on either the TMX-M12 or the TMX-M14
Link-3	Choose this option cause this interface to draw it's signal from TX interface 3. Only available on the TMX-M14.
Link-4	Choose this option cause this interface to draw it's signal from TX interface 4. Only available on the TMX-M14.
OFF	Marks the interface as non-operational. Virtual channels may be associated with the interface, but those channels will carry no traffic.
Tx-Only	Puts the interface into transmit-only mode. To the extent possible, this value decouples the transmit and receiver interfaces.

Standard

Defines attributes of the multi-program transport stream transmitted from this interface.

ASI, 188-ACBR/, ASI-204-ACBR	Configures the interface to provide an ASI-compliant 188-byte, or 204-byte, constant bit rate adaptive transport stream. A transmitter must be explicitly configured to use 188-byte or 204-byte packets. Given a constant bitrate stream to emit, the interface dynamically adjusts its output clock to maintain the output, without inserting or deleting null packets. It uses the configured output rate as the nominal value for the multiplex, but it allows the actual rate to exceed the configured value by 1% to account for hardware clock differences between systems.
ASI, 188-Byte Packets, CBR / ASI, 204-Byte Packets, CBR	Configures the interface to provide an ASI-compliant 188-byte, or 204-byte, constant bit rate transport stream.
ASI, 188-Byte Packets, VBR / ASI, 204-Byte Packets, CBR	Configures the interface to provide an ASI-compliant 188-byte, or 204-byte, variable bit rate transport stream.
ASI, ISDTV	This denotes Asynchronous Serial Interface (ASI), carrying ISDTV information. This additionally implies 204-byte packets and constant bitrate transport streams. The module reads packets out of their buffer at a constant rate and inserts null transport stream packets to bring the output rate of the multiplex up to the required value.

Note: The TMX does not re-stamp PCRs when 'Enable Pass Through ' is 'checked' and the 'Standard ' is set to 'ASI, 188-Byte Packets, VBR'.

SMPTE 310M	Configures the interface to provide a SMPTE 310M-compliant stream of 188-byte packets at a fixed rate of 19.39265846 Mbps. The module inserts null packets, as required, to maintain this constant output rate.
asi-mph	This denotes ASI carrying MPH (mobile/pedestrian/handheld) information using 188-byte packets. The interface uses the configured output rate, though 19.392659 Mbps is recommended for an ATSC broadcast (approximating the SMPTE-310 rate of 19.39265846 Mbps). Only TMX-M12 supports this output standard. Moreover, only the interface 1 logic can emit an MPH stream, though both interfaces can be configured with the value. When MPH is in use, the second transmitter should be linked to interface 1, so the same stream is emitted on both connectors. That is, set txIfc.2/mode=link-1, effectively disabling the logic for interface 2.
smpte-mph	This denotes SMPTE-310M carrying MPH (mobile/pedestrian/handheld) information. The module reads packets out of their buffer at a constant rate and inserts null transport stream packets or opportunistic data to bring the output rate of the multiplex up to the SMPTE-310M rate (19.39265846 Mbps with 188-byte packets). Only TMX-M12 supports this output standard. Moreover, only the interface 1 logic can emit an MPH stream, though both interfaces can be configured with the value. When MPH is in use, the second transmitter should be linked to interface 1, so the same stream is emitted on both connectors. That is, set txIfc.2/mode=link-1, effectively disabling the logic for interface 2. In all cases, output packets have their PCR adjusted: adjusted_PCR = original_PCR + (system_clock - timestamp)

Clock

Specifies the interface line clock source. To ensure proper communication, the sender and receiver must synchronize their data clocks.

In a NetVX-only network, each NetVX uses internal timing on each transmit interface. When receiving data, a NetVX uses the received clock to extract the payload from the phyiscal layer bitstream. Clock differences of up to ± 20 ppm on the internal clock permit data to be extracted correctly.

Normally, transmit interfaces 'one' (txifc.1) and 'two' (txifc.1) operate independently. Some combinations of the standard and timing affect this independence. Consider tx.1 the dominant interface in these interactions, with its configuration placing constraints on tx.2. The following table describes the constraints.

Table 11-1 TMX TX Interface 'Standard' and 'Clock' Setting Dependencies

Standard	TX1				Standard	Allowed TX2 config based on TX1			
	External	Internal	Loop	SFN		External	Internal	Loop	SFN
ASI-188	●	●	●	❍	ASI-188	any	any	❍	❍
					ASI-204	any	any	❍	❍
					SMPTE-310M	any	any	any	❍
ASI-204	●	●	●	●	ASI-188	any	any	❍	❍
					ASI-204	any	any	❍	❍
					SMPTE-310M	any	any	any	❍
ASI-ISDB	●	❍	❍	●	ASI-ISDB	standard and clock must match TX1. TX2 is a copy of TX1.			
SMPTE-310M	●	●	●	❍	ASI-188	any	any	❍	❍
					ASI-204	any	any	❍	❍
					SMPTE-310M	standard and clock must match TX1			❍

external The interface uses the reference clock from the system controller.

internal The interface uses an internal clock to drive the transmit data circuitry.

loop The transmit interface uses timing derived from receive interface one, which must be supplied a SMPTE-310M signal. The transmitter locks its clock to the arriving bit stream and clocks its outgoing data to match the rate being received. See below for more details. In this timing model, the configured transmit rate is ignored; the actual transmit rate matches the SMPTE-310M input signal (19.39265846 Mbps). ATSC M/H applications commonly use loop timing.

SFN The TX interface uses timing from Rx1, which must be fed with a BTS (204-byte) signal. The transmitter locks its clock to the incoming bitstream. This works only between TX1 and RX1 and the RX standard must be set to auto.

Rate

Sets the output bit rate of the transport stream transmitted from this interface.

0 to 213.72 This is the range of rates when the Interface Standard (above) is set to either 'ASI-188-CBR' or 'ASI-188-VBR'. When using this standard setting, every 8-bit byte occupies 10 bits on the physical medium. Additionally, packets are separated by 2 padding bytes.

Using this format, the carrier rate (or raw bandwidth) for a given transport stream rate is the following:

```
carrier_rate = ts_rate * (10/8) * (190/188)
213.7263158 = 270 * (8/10) * (188/190)
```

0 to 197.12 This is the range of rates when the Interface Standard (above) is set to either 'ASI-204-CBR' or 'ASI-204-VBR'. Every 8-bit byte occupies 10 bits on the physical medium. Additionally, packets are separated by 2 padding bytes. Finally, the rate is computed for 188-byte packets, even though 204 bytes of data are present.

Using this format, the carrier rate (or raw bandwidth) for a given transport stream rate is the following:

```
carrier_rate = ts_rate * (10/8) * (206/204) * (204/188)
197.1262136 = 270 * (8/10) * (204/206) * (188/204)
```

0 to 19.39 This is the range of rates when the Interface Standard (above) is set to 'SMPTE-310m'.

Enable Pass Through

If checked, allows this interface to pass through the transport stream without de-multiplexing.

Note: (1) The TMX does not re-stamp PCRs when 'Enable Pass Through ' is 'checked' and the 'Standard ' is set to 'ASI, 188-Byte Packets, VBR'. (2) Pass Through is disabled when more than one VC is configured to operate on the interface. To re-enable Pass Through, delete all but one VC and check this control.

Enable Sync Inversion

Enables/disables the sync byte inversion for this interface..

enable Turns off sync inversion. All transport stream sync bytes are transmitted as 0x47.

disable Turns on sync byte inversion for 'smpte-mph'.The start of each M/H frame uses 0xB8 instead of 0x47. Sync byte inversion is typically 'enabled' for SMPTE M/H, but it can be 'disabled' for downstream equipment that does not support inversion.

Enable Loopback

Use this control to loop ASI or 310M input from the same-numbered receiver out this transmitter.

OFF Does not loop back input.

External Does loop back input.

Note: See "How to Loopback ASI or 310M Input" on page 94 for details.

11.6.4 Config > TS Transmitter > Demultiplexer VC Tab

Abstract: *This table displays a row summarizing the settings of each VC associated with the selected TMX transmit interface.*

VC
Indicates the VC number.

State
Indicates if the VC is active or inactive.

Interface
Indicates the demultiplexer interface that this VC is associated with.

TS Rate (Mbps)
Indicates the policing rate for this virtual channel. Data are dropped if this rate is exceeded.

Program
Specifies the program number associated with this demux VC.

Function
Indicates the function in which this VC is configured to operate.

PID
Indicates the number of the PID, in the multiplexed transport stream, form which this VC is configured to extract data (when the VC's 'Function' is set to 'PID').

Audio Filter
Displays the HEX values forming the audio PID filter.

Data Filter
Displays the HEX values forming the data PID filter.

Drop Conditional Access
Indicates if this VC is configured to drop Conditional Access (CA) information.

Enables/disables the disposal of Conditional Access (CA) data on this VC.

enable	Directs the VC to discard all CA information. Specifically, the Entitlement Control Message (ECM) stream, and any CA descriptors, referenced through the PMT.
disable	(default) Allows the VC to pass CA information intact.

VC Degrade
Indicates the state of VC degrade alarm notification on this interface.

VC Fault
Indicates the state of VC fault alarm notification on this interface.

Rate (Mbps)

Sets the output bit rate of the transport stream transmitted from this interface.

0 to 213.72 This is the range of rates when the Interface Standard (above) is set to either 'ASI-188-CBR' or 'ASI-188-VBR'. When using this standard setting, every 8-bit byte occupies 10 bits on the physical medium. Additionally, packets are separated by 2 padding bytes.

Using this format, the carrier rate (or raw bandwidth) for a given transport stream rate is the following:

```
carrier_rate = ts_rate * (10/8) * (190/188)
213.7263158 = 270 * (8/10) * (188/190)
```

0 to 197.12 This is the range of rates when the Interface Standard (above) is set to either 'ASI-204-CBR' or 'ASI-204-VBR'. Every 8-bit byte occupies 10 bits on the physical medium. Additionally, packets are separated by 2 padding bytes. Finally, the rate is computed for 188-byte packets, even though 204 bytes of data are present.

Using this format, the carrier rate (or raw bandwidth) for a given transport stream rate is the following:

```
carrier_rate = ts_rate * (10/8) * (206/204) * (204/188)
197.1262136 = 270 * (8/10) * (204/206) * (188/204)
```

0 to 19.39 This is the range of rates when the Interface Standard (above) is set to 'SMPTE-310m'.

Computed Bandwidth (Mbps)

This read-only value provides an estimate of the amount of bandwidth that is currently in use on this interface. Vidiem™ derives this value from the sum of any local sources (sources in the same system) such encoders or demultiplexers. This value will not accurately reflect the potential bit rates the interface could experience if, for example, it is carrying traffic from a burst source such as a GBE interface.

In all cases, the 'Computed Bandwidth' should never be a negative value. A negative value indicates that the interface is over-subscribed.

11.6.5 Config > TS Transmitter > Interface > Transport Stream Dialog

Transport Stream

SI-PSI Mode

Use this control to specify the system information table paradigm for the transport stream leaving this interface.

ATSC Generate control tables appropriate for ATSC broadcasters.

DVB Generate control tables for the Digital Video Broadcasting project.

ISDB Generate control tables appropriate for ISDB-Tb (International Standard for Digital Television). In addition to the generic MPEG tables, ISDB-Tb includes the network information table from DVB (NIT), service description table from DVB (SDT), event information table from DVB (EIT), and time offset table (TOT). See ARIB STD-B10, Service Information for Digital Broadcasting System for details.

MPEG Generate generic MPEG control tables.

None Generate no tables. To form a correct MPEG stream, the control tables would need to be inserted by other means.

Transport Stream ID

Use this control to specify the Transport Stream ID (sometime referred to as the 'TSID') for the multiplexed output stream leaving this interface.

Note: This control affects the same setting as the Transport Stream ID in the See Section 11.6.12, "Config > TS Transmitter > Interface > ISDB-Tb Localization Dialog" on page 335.

EMM Base PID

Use this control to set the EMM Base PID value used with Conditional Access.

-1 This is the default value, it assigns the EMM Base PID to 8194.

32-8191 Range of possible EMM PID values.

Note: In previous releases, the NetVX set this parameter to '8194' by default

Automatic, Set Base PID to Program 1 (radiobutton)

Check this option and specify the Base PID value to assign to Program 1 below.

Automatic, Set Program to PID 48 (radiobutton)

Check this option and specify the Program to assign to PID 48 below.

PID Map Manual (radiobutton)

Check this option to manually map all PIDs.

ATSC

Note: The 'Carrier Frequency' control (below) is only enabled when the 'SI-PSI Mode' control (above) is set to ATSC.

Carrier Frequency (MHz)

Specifies the ATSC carrier frequency for this stream. For US terrestrial channels, the carrier frequencies depend on the modulation mode, which can be analog or digital. We currently assume digital modulation (8 VSB), giving the following frequency assignments.

Every channel occupies a 6 MHz band within its range, so the base frequencies for channels 2, 3, and 4 are 54 MHz, 60 MHz, and 66 MHz. ATSC digital channels use the base frequency plus 310 KHz.

DVB

Note: The 'Network ID' and 'Delivery System Type' controls (below) are enabled only when the 'SI-PSI Mode' control (above) is set to DVB.

Network ID

Specifies the DVB network identifier for this stream. This 16-bit value identifies the network delivery system when the system information mode is set for DVB. Other SI modes ignore this value. See DVB A038 and ETSI ETR-162 for details.

Note: This control affects the same setting as the Network ID in the See Section 11.6.12, "Config > TS Transmitter > Interface > ISDB-Tb Localization Dialog" on page 335.

Delivery System Type

Specifies the DVB delivery system descriptor for this stream (See DVB document A038 for further details).

This control also enables the controls on the respective, underlying page.

- See Section 11.6.7 "Config > TS Transmitter > Interface > Cable Delivery System Dialog" on page 331
- See Section 11.6.8 "Config > TS Transmitter > Interface > Satellite Delivery System Dialog" on page 332
- See Section 11.6.9 "Config > TS Transmitter > Interface > Terrestrial Delivery System Dialog" on page 333

11.6.6 Config > TS Transmitter > Interface > Transport Stream, Network Dialog

Abstract: *This page is provided for support of ATSC A/110B distributed transmission OM packet emission on the TMX.*

DTP Num. Tiers

The number of tiers in the distributed transmission network. Only applies to ATSC mode. Does not apply if MPH or ISDB are active. A value of zero turns off the distributed transmission network support.

DTP Interval (ms)

The interval (in milliseconds) between distributed transmission OM packets. OM packets cycle through all tiers, so a given tier gets an OM packet every dtpInterval * dtpNumTiers milliseconds. Only applies to ATSC mode and only when dtpNumTiers is non-zero. Does not apply if MPH or ISDB are active.

11.6.7 Config > TS Transmitter > Interface > Cable Delivery System Dialog

Abstract: *Use the controls in this dialog to specify the cable delivery system descriptor as defined in Section 6.2.8.1. of DVB A038*

Frequency (MHz)
Use this control to specify the delivery frequency in megahertz.

Modulation
Use this control to specify the mode of modulation.

Symbol Rate (Msym/sec)
Use this control to specify the symbol rate.

Inner FEC
Use this control to specify the Inner FEC scheme.

Outer FEC
Use this control to specify the outer FEC scheme.

11.6.8 Config > TS Transmitter > Interface > Satellite Delivery System Dialog

Abstract: *Use the controls in this dialog to specify the satellite delivery system descriptor as defined in Section 6.2.8.2. of DVB A038.*

Frequency (GHz)
Use this control to specify the signal frequency in Gigahertz.

Modulation
Use this control to specify the modulation type.

Symbol Rate (Msym/Sec)
Use this control to specify the signal's symbol rate.

Inner FEC
Use this control to specify the Inner FEC scheme.

Polarization
Use this control to specify the type and direction of signal polarization.

Orbital Position
Use this control to specify the orbital position in degrees azimuth.

11.6.9 Config > TS Transmitter > Interface > Terrestrial Delivery System Dialog

Abstract: *Use the controls in this dialog to specify the terrestrial delivery system descriptor as defined in Section 6.2.8.3. of DVB A038.*

Center Frequency (MHz)
(Available in a future release).

Constellation
(Available in a future release)

Bandwidth
(Available in a future release)

Transmission Mode
(Available in a future release)

Other Frequencies Used (checkbox)
(Available in a future release)

Hierarchy Information
(Available in a future release)

High-Priority Code Rate
(Available in a future release)

Low-Priority Code Rate
(Available in a future release)

Guard Interval
(Available in a future release)

11.6.10 Config > TS Transmitter > Interface > ISDB-Tb Modulation Dialog

Abstract: *Use the controls on this page to configure the modulation scheme used to carry the ISDB-Tb signal.*

Carrier Frequency
Specifies the Carrier Frequency for the signal on this interface.

Guard Interval
Specifies the guard interval used in the modulation scheme.

Enable Partial Reception (checkbox)
Enables/disables the inclusion of the partial reception descriptor.

Hierarchy Segments: A 1, B 12
Use this slider to allocate bandwidth between the A and B hierarchies.

Capacity (Mbps) A, B (read-only)
Indicates the amount of bandwidth this hierarchy can use.

Available (Mbps) A, B (read-only)
Indicates the available amount of bandwidth for this hierarchy.

Emergency Alert Broadcast

Enable EAB (checkbox)
Enables/Disables the Emergency Alert Broadcast.

EAB Signal Level
Specifies the emergency alert signal level.

11.6.11 Config > TS Transmitter > Interface > ISDB-Tb Hierarchies Dialog

Hierarchy A or B Modulation

The top and bottom sections of this page are identical. The top section sets the parameters for Hierarchy A and the bottom section Hierarchy B.

Hierarchy (A or B) Modulation
Specifies the modulation scheme for the designated hierarchy

DQPSK	*The modulator uses Differential Quadrature Phase-shift Keying.
QPSK	*The modulator uses Quadrature Phase-shift Keying.
16 QAM	The modulator uses 16-QAM.
64 QAM	*The modulator uses 64-QAM.

Inner Code
Specifies the forward error correction inner code for the designated hierarchy.

Interleave
Specifies the multiplexer interleaving for the designated hierarchy. The interface's 'Transmission Type' (below) affects the values allowed for this parameter.

Transmission Type

Specifies the transmission type information for the designated hierarchy. This 8-bit value is left to the discretion of the individual broadcaster. (Mbps).

11.6.12 Config > TS Transmitter > Interface > ISDB-Tb Localization Dialog

Country

Specifies the country code for this interface's time zone. Select a country from the drop down, or see ISO 3166 to help determine the best value to use.

Region

Specifies the region. Typically, this is a geographical region within the country, associated with this interface's transport stream. The value '0' (zero) indicates the absence of region information.

Remote Control Key

Specifies the remote control key ID. This value assigns the "major channel number" to the transport stream. This value is the public-facing value used by the consumer to tune to the stream with a remote control. The operator is responsible for correctly setting this value.

Area Code

Specifies the 12-bit area code, defined by the local country

State

The 'State' value occupies the first five bits of the 'Area Code'. Choose the desired 'State' value from the drop down.

Micro-Region

The 'Micro-Region' value occupies the last seven bits of the 'Area Code'. Choose the desired 'Area Code' value from the drop down.

Generating Station

Enter the unique 'Generation Station' value and provided by ANATEL. This value should start with 'ZY'.

Note: If this value is entered, then the 'Network ID' and the 'Transport Stream ID' are calculated from it.

— OR —

Network ID

Enter the 'Network ID' provided by ANATEL.

Note: This control affects the same setting as the Network ID in Section 11.6.5, "Config > TS Transmitter > Interface > Transport Stream Dialog" on page 328.

Transport Stream ID

A "16 bits field whose function shall be the identification flag of a TS of any other multiplexer present in the network. This value shall be set by the user" [1].

Note: This control affects the same setting as the Transport Stream ID in Section 11.6.5, "Config > TS Transmitter > Interface > Transport Stream Dialog" on page 328

[1] Multiplexing and Service Information, Part 2: Data Structures and Definition of SI Information, ABNT NBR 15603-2

11.6.13 Config > TS Transmitter > Interface > ISDB, Time Dialog

Transition Date

The date on which a time zone change occurs, in YYYY-MM-DD format.

Transition Time

This value gives the local time when a time zone change occurs, in hh:mm:ss format. Using local time is convenient for the operator and the system. An example transition out of DST occurred in the USA on October 26, 2003 at 2:00 AM (02:00:00).

Local UTC Offset

This value gives a signed offset between UTC and the local time, in hh:mm format. A leading "-" indicates a negative offset; a leading "+" (or no sign) indicates a non-negative offset. The value is intended to specify the offset from UTC before the time zone transition, but its exact interpretation depends on the transition details. See the transition steps below for details.

Next UTC Offset

This value gives a signed offset between UTC and the local time, in hh:mm format. A leading "-" indicates a negative offset; a leading "+" (or no sign) indicates a non-negative offset. The value is intended to specify the offset from UTC after the time zone transition, but its exact interpretation depends on the transition details. See the transition steps below for details.

The system keeps its internal clock in UTC and does not maintain local time. Nevertheless, these DST transition parameters give a way to construct the appropriate local values for the system information tables.

- If the DST date and time indicate a future transition, the local time offset gives the current offset from UTC. That is, UTC plus local_time_offset gives the local time.
- To determine whether the transition has passed already, the system computes the local time as in the previous step. If the result is after the dst_date and dst_time, the local_time_offset is obsolete. At this point, UTC plus next_time_offset gives the true local time.
- If no time zone changes are necessary (such as the region not observing daylight saving time), the values should be set as follows. Set dst_date at least one year in the past (the default 2000-01-01 suffices). Set both local_time_offset and next_time_offset to indicate the current time zone offset from UTC. Technically, setting the dst_date a year in arrears tells the system to use local_time_offset, but setting both time offsets to the same value avoids confusion.

If the values indicate a DST transition should occur, the transition date will eventually arrive, trigger the change, and then recede. At that time, the next transition could be configured. To help alert the operator to an obsolete configuration, the system asserts an alarm (modDeg, Configuration Error) when the transition date is more than a couple of months in the past. The alarm is not asserted if the transition date is more than one year in the past.

11.6.14 Config > TS Transmitter > Interface > PmtRef Table

The pmtRef table provides a way to insert arbitrary entries into a single PMT, or all PMTs. Entries are not checked for conflict with existing PIDs and do not affect the PID mapping algorithms used by the TMX. You can include an externally produced PID in your multiplex, and reference it from PMTs on the interface. A table PmtRef is available for each Tx interface, with 32 entries each. The following elements are contained in a table entry:

rowstate

Description: Specifies this row's state

Value(s): active, inactive, create, destroy

active The entry is allocated and enabled for the service

inactive The entry is allocated but not currently in use

create To create a new entry in the table, a manager selects an index and sets that row's state to create. If the index is valid and that row is not allocated in the table, the system creates a new row at the specified index. Otherwise the SET operation fails. After creating a new row in the table, the system sets its state to inactive.

destroy Eliminates the row from the table. Any row can be destroyed, regardless of its current state or whether it exists.

pid

Description: Specifies the packet identifier to be added to a program's PMT. No checking is done for conflicts with PIDs already in the program's PMT.

Value(s): 0-8190

0 Indicates an inactive entry. When zero, other fields are not considered.

1-8190 Indicates an active entry

prognum

Description: The Program that the PID should be added to.

Value(s): 1-65535

0 Indicates the PID should be added to all PMTs generated on the interface

1-65535 The PID is added only to the specified program. If no program with a matching program number exists in the MPTS, this pmtRef entry is ignored

ifc

Description: The interface to whose PMTs the reference is to be added.

Value(s): tx-1, tx-2

tx-1 Interface 1

tx-2 Interface 2

descriptors

Description: Specifies the descriptors carried by the PMT reference entry. Descriptors are described in the MPEG specification (ITU-T Rec. H.222.0, Section 2.6, Table 2-39).

Value(s): length, data

length Indicates the length of the descriptor data field in bytes

data N bytes of descriptor data

streamtype

Description: Specifies the stream type of the reference. This value is not checked for validity.

Value(s): 0 to 0xff

11.6.15 Config > TS Rx and Tx > Router Dialog

Note in the navigation tree as to whether the interface that you are configuring is a transmitter or a receiver, then see the appropriate topic below.

- "Receive Interface Router Settings" on page 450.
- "Transmit Interface Router Settings" on page 458.

11.7 TS Transmitter > VC Control Branch

11.7.1 Config > TS Transmitter > VC Control Dialog

Abstract: *Use this dialog to create and manage VCs carrying input to the selected transmitter interface.*

Note: This dialog is identical to the "Config > TS Multiplexers > VC Control Dialog" described on page 363.

Entries

Provides a list of all VCs associated with the selected multiplexer interface. Highlight any VC in the list of entries to see its current settings.

Control

Tag

Use this field to enter a descriptive tag uniquely distinguishing this virtual channel. The tag may be up to 31 characters long.

Enable Degrade Alarms

Check this box to enable the NetVX to notify of signal degrade alarm events for this virtual channel.

See the topics "Overview of NetVX Alarms" on page 214 and "VC Degrade Alarms" on page 504 for more details.

Enable Fault Alarms

Check this box to enable the NetVX to notify of signal fault alarm events for this virtual channel.

Use Hexadecimal PIDs

This control is a global control affecting the presentation of PID (and some other) values. Some standards, practices require users to interact with actual he xi decimal values, while others do not. Use this checkbox to affect the presentation of he xi decimal values.

Checked Vidiem presents he xi decimal values as such.

unchecked Vidiem presents he xi decimal values as decimal values. Internally the system ‘does the right thing’ with these values according to specifications, etc.

Function

Use this control to specify the function of this VC in the multiplexed transport stream.

Conditional Access This VC will carry conditional access information. Many transport streams carry conditional access data, supporting encryption services to protect a stream's contents. When a VC's function is set to this value, the PIDs referenced in the VC's input conditional access table are multiplexed into the transport stream for the referenced interface, and the conditional access table is constructed appropriately. A multiplexer interface may have no more than one conditional access VC.

M/H Use this setting when the interface on which the VC is located is configured for ‘MPH’.

PID This VC insert a single PID's packets into the transport stream. The module isolates the selected packets (see the VC's packet identifier for details), drops all other packets in the VC (if any), remaps the selected packets to the VC's PID, and inserts those packets into the interface's multiplex. The PID is not added to the PAT or any PMT. When a PID is configured for individual insertion, no other VC on the same interface should insert packets on that PID, either explicitly or implicitly. The module asserts an alarm (VC Degrade - Configuration Error) if this constraint is violated.
Note: This function supports ‘unusual’ applications and might require application engineering support to configure correctly. The VC inserting this single PID may be connected like a normal multiplexer virtual VC. The most useful source is likely to be a demultiplexer VC, whose function is set to extract a specific PID from a multiplex.

Program Use this setting to multiplex the program carried on this VC into the transport stream. The module builds the transport stream's PAT based on the VC's program number. The transport stream is provided on the specified interface.

Note: A multiplexer interface may have no more than one conditional access channel.

Program Number

Use this control to specify the program number that shall identify the program on this VC in the multiplexed multi-program transport stream (MPTS).

0 Data enter the multiplex through this VC without adding a PAT entry. Use this selection to add Program and System Information Protocol (PSIP) data to the transport stream.

1 to 509 Specifies the program number assigned to data entering to the MPTS from this VC.

Protection Level

Specifies this VC's channel protection level. This parameter applies only to channels assigned to a transmit interface. If the transmit rate is about to be exceeded (leading to transmit buffer overflow), the interface discards packets from 'low' VCs to avoid dropping packets from 'high' VCs. The interface will drop 'high-priority' traffic if necessary, but only after dropping all 'low-priority' packets.

Note: (1) Any dropped packet, whether high or low protection, contributes to a 'transmit buffer overflow' alarm.
(2) This parameter requires the interface not to be operating in 'pass-through' mode.
(3) This parameter requires the interface not to be operating in 'SI Mode' set to either 'ISDB' or 'MPH'.
(4) This parameter requires the interface not to be operating a 'StatMux' group.

New (button)

To activate a new VC, highlight an unused VC entry and press this button.

Delete (button)

To delete a VC, highlight a configured VC entry and press this button.

11.7.2 Config > TS Transmitter > VC Control > Program, ISDB Dialog

Current Function

Hierarchy

Use this drop down to select between hierarchies.

Partial Reception VC

This parameter specifies the backup A channel that a hierarchy B ISDTV channel should use in a partial reception condition. The hierarchy A backup channel should be assigned to the same transmit interface as this channel.

ISDTV can use hierarchy A and B programs in pairs. The paired programs typically use different levels of error correction, resolutions, and rates. If the main program (in hierarchy B) has poor reception, the receiver can opt to decode the designated backup program (in hierarchy A).

0 This value explicitly signifies this channel has no assigned backup for partial reception conditions.

1 to 63 These values specify the VC index of the backup channel. The transport stream will carry the backup's program number, but this parameter is the channel index.

Direct Service ID

Use this field to explicitly specify the 'Device Service ID'.

Computed Service ID

Use this option to cause Vidiem to calculate and use the 'Service ID' based on settings for the 'Network ID', 'Service Type', and 'Service Number' (below).

Service Number

This dropdown is provided to help set the 'Program Number' to a value that is unique in the stream. Changing this dropdown affects the last digit of the 'Computed Service ID' and it also affects the 'PMT PID' value of the mobile stream as shown in Table 11-2 below. Values in this table are from "Table 49 – Partial Peception PIDs distribution" in "SBTVD N08-3, Operational Guidelines Part 3: Multiplexing and Service Information, Section 6."

Table 11-2 Relationship Between Service Number Options and PMT PID Values for ISDB-Tb Mobile Streams

Service Number	PMT PID Value
0	8136
1	8137
2	8138
3	8139
4	8140
5	8141
6	8142
7	8143

Hierarchy (Either A or B)

Hierarchy Capacity (Mbps)

Indicates the amount of bandwidth this hierarchy can use.

Available Bandwidth (Mbps)

Indicates the amount of bandwidth currently available to this hierarchy.

11.7.3 Config > TS Transmitter > VC Control > M/H Ensemble Dialog

Abstract: *Use this dialog to configure the MH stream.*

Entries

Lists all virtual channels (VCs) associated with the selected demultiplexer interface. Highlight any VC in the list of entries to see its current settings.

Current Function

Indicates the Function in which the selected VC is configured to operate. A VC must be configured with the 'M/H' function in order for controls on this page to become editable.

Parade ID

Use this control to specify the parade ID for this VC.

Ensemble

Use this control to specify the ensemble this VC should carry.

primary This VC carries the primary ensemble.

secondary This VC carries the secondary ensemble.

Note: (1) The following settings must be configured to match those expected by the transmitter to which you are connecting. Check the transmitter's settings for details.
(2) Each of these parameters affect the bitrate consumed by the M/H stream. Be sure to note the final rate when you complete the settings on this page.

Number of Groups

Use this control to specify the number of MPH groups. Up to eight group may be selected.

RS Code

Specifies the MPH SCCC code mode for this VC. This channel parameter determines the number of parity bytes.

24 Use 24 parity bytes: RS code (211, 187).

36 Use 36 parity bytes: RS code (223, 187).

48 Use 48 parity bytes: RS code (235, 187).

Repetition Cycle

The repetition cycle represents how often an Ensemble is transmitted. Currently this control is fixed to '1' and is provided for future expansion.

SCCC Outer Code A–D

Use these controls to configure the serially concatenated convolutional code (SCCC) settings.

1/2 This setting permits more data.

1/4 This setting data is more robust.

SCCC Block Mode

Specifies the MPH SCCC block mode for this VC. This channel parameter determines the grouping of the SCCC blocks.

1 Each SCCC Block consists of a single MPH block.

2 Each SCCC Block consists of a two MPH blocks: (B1, B6), (B2, B7), (B3, B8), (B4, B9), (B5, B10).

MH Information

VC M/H Rate

Indicates the total number of kilobits consumed by this ensemble.

Total M/H Groups

Indicates the total number of M/H groups.

Avail. ATSC Rate

Uses all settings on this page to calculate and display the total rate remaining for ATSC broadcasting after deducting M/H bandwidth.

Related Topics

- Section 3.13.1, "How to Configure Mobile/Handheld (M/H) on an ATSC Broadcast Configuration" on page 132
- Section 13.2.7, "Config > IP Modules > M/H Services Tab" on page 404
- Section 13.3.3, "Config > IP Modules > M/H Services" on page 408

11.7.4 Config > TS Transmitter > VC Control > Program, Scrambling Dialog

Abstract: *Use the controls in this dialog to configure BISS scrambling on the selected TMX output interface.*

Current Function

This control indicates the function that this VC is currently configured to operate under.

Encryption Mode

Select the form of encryption to apply to the stream transmitting on the selected interface.

None Choose this option to decode un-encrypted MPEG-2 transport streams.

BISS Mode 1 Choose this option to decode MPEG-2 transport streams encrypted using BISS Mode 1.
BISS Mode 1 requires a 'Clear Session Word'. Enter this string in the entry box provided.

BISS Mode E Choose this option to decode MPEG-2 transport streams encrypted using BISS Mode E.
BISS Mode E requires both an 'Encrypted Session Word' and an 'Injected Identifier'.
Enter the 'Encrypted Session Word' in the entry box provided.
Press the 'New' button at the bottom of the screen to open the 'Injected Identifier' dialog and to enter that information.
See "Config > Decoder > Program > Descrambling Injected Identifier Dialog" on page 303 for details.

BISS Session Word

Specifies the BISS Session Word for this VC. The encoder allows its Session Word to be written and read – unlike the decoder, which protects its Session Word from being read. The BISS Session Word behaves like a 'normal' configuration value. The Session Word is part of the system's configuration and may be stored internally a profile. Loading a stored profile or configuration file can alter Session Words for VCs. Additionally, a Session Word follows the active service during module failover and failback.

– none – When no BISS scrambling is desired (or allowed), this value may be the empty string.

– string – Specifies the Session Word; a 12-character, hexadecimal string, such as 0a3b5c7d9e1f (upper-case and lower-case letters allowed). The 'New' button, described below, may be used to generate this string.

New (button)

Press his button to cause Vidiem™ to create a new injected identifier.

BISS Encrypted Session Word Tool

Decoder Injected Identifier

Enter the 14-character Injected Identifier in this text box, or press the 'New' button (above) to have Vidiem™ create new Injected Identifier.

Encrypted Session Word

Indicates the Encrypted Session Word, which is derived from the 'BISS Session Word' and the 'Decoder's Injected Identifier'.

11.7.5 Config > TS Transmitter > VC Control > Opportunistic Data Dialog

Abstract: *Use the controls in this dialog to configure the selected output stream to support Opportunistic Data insertion.*

Current Function

This read-only field indicates the selected VC's current function.

Program Number

Use this control to specify the number of the number of the program carried on this VC.

TS Rate (Mbps)

Use this field to specify the Transport Stream rate for this opportunistic data VC.

Flow Control

PID

Use this field to specify the PID on which this opportunistic data program should be carried within the transport stream,

VC

Use this field to specify the number of the VC that shall operate as the flow control return path; connecting to the data source and governing the opportunistic data VC.

11.8 TS Transmitter Status

11.8.1 Status > TS Transmitters Table

Abstract: *This table summarizes the status of all the system's TMX transmit interfaces. Each column presents status for a given interface.*

Packets
Maintains a count of the number of packets transmitted over this interface.

TS Rate (Mbps)
Indicates the rate at which data is being transmitted over this interface.

Standard
This field indicates the transport stream standard for this interface.

TX Buffer Overflow
Indicates if the transmit interface is experiencing a transmit buffer overflow.

PAT Version
Indicates the PAT version number for this interface's transport stream. The Program Association Table carries a 5-bit field that changes whenever the PAT definition changes.

Transport Stream ID
Indicates the transport stream ID for this interface. This 16-bit value identifies a transport stream from any other multiplex within a network. Zero indicates the TSID is unavailable.

Data Carousel Status

Data Carousel Packets
Maintains a count of packets inserted from this interface's data carousel.

Data Carousel Rate (Mbps)
Indicates the computed transport stream bitrate for the interface's data carousel. Regardless of the configured bitrate, this value provides the actual rate at which carousel data are being inserted into the transport stream.

11.8.2 Status > TS Transmitters > Interface Tab

This table displays much of the same status information shown in the TS Transmitters table, but only for the interface selected in the status tree. This tab also displays additional information about the data carousel.

Packets
Maintains a count of the number of packets transmitted over this interface.

TS Rate (Mbps)
Indicates the rate at which data is being transmitted over this interface.

Standard
This field indicates the transport stream standard for this interface.

Far-End Errored Seconds
Indicates transmit (far end) errored seconds. Generally, this error category includes conditions that originate outside the system itself. Currently this parameter is triggered by an incrementing number of seconds in which the interface experiences transmit buffer overflow.

TX Buffer Overflow

Indicates if the transmit interface is experiencing a transmit buffer overflow.

PAT Version

Indicates the PAT version number for this interface's transport stream. The Program Association Table carries a 5-bit field that changes whenever the PAT definition changes.

Transport Stream ID

Indicates the transport stream ID for this interface. This 16-bit value identifies a transport stream from any other multiplex within a network. Zero indicates the TSID is unavailable.

Data Carousel Status

This field indicates if the carousel is experiencing a fault.

Data Carousel Packets

Maintains a count of packets inserted from this interface's data carousel.

Data Carousel Rate (Mbps)

Indicates the computed transport stream bitrate for the interface's data carousel. Regardless of the configured bitrate, this value provides the actual rate at which carousel data are being inserted into the transport stream.

Current Data Carousel Identification

Identifies the interface's current data carousel file. This value is derived from the File Description descriptor in the carousel file. If no file has been loaded into the current carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Current Data Carousel Start Time

Indicates the start time of the interface's current data carousel file. The value is a text string, representing the designated date and time in ISO 8601 format. The time might be in the past or the future. If the carousel file does not have an Activation Time descriptor, the system uses the time at which the file became current. If no file has been loaded into the current carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Current System Time

Provides convenient access to the current system time for comparison with the 'Current Data Carousel Start Time' shown above.

Late Data Carousel Packets

Provides a count of late packets inserted from this interface's data carousel.

Next Data Carousel Identification

Identifies the interface's next data carousel file. This value is derived from the File Description descriptor in the carousel file. If no file has been loaded as the next carousel, this parameter indicates 'none'. The state of the carousel streaming does not affect this variable.

Next Data Carousel Start Time

This field indicates the time at which the next data carousel shall begin streaming.

11.8.3 Status > TS Transmitters > Demultiplexer VC Tab

Packets

Maintains a count of the number of packets transmitted over this VC.

TS Rate (Mbps)

This field indicates the rate at which data is being transmitted over this VC.

Program

Program Present

Indicates if any programs are detected within the stream being transmitted by this VC.

Failure

Indicates processing failure on this VC. When a VC is configured for special function processing, several conditions can cause a failure. If the module encounters processing errors, it will declare an alarm (vcDeg, transport stream errors). The utility clear command resets this value to noFault.

No Fault	Indicates processing appears to be operating properly.
Fault	Indicates the VC appears to be operating improperly.
Unknown	Indicates the module cannot determine the status of this VC.

SI-PSI Continuity Counter Errors

Maintains a count of the number of System Information continuity count errors detected in this VC.

SI-PSI CRC Errors

Maintains a count of the number of System Information CRC errors detected in this VC.

11.8.4 Status > TS Transmitters > Program Tab

Program

Provides an index number for each program located in the transport stream.

Name

Indicates the name for this program, as obtained from the MPEG stream. Typically, this value is inserted by an encoder or another entity that creates transport streams.

PCR PID

Indicates the PID that carries this program's PCRs. If the program does not have PCRs, this parameter takes on the value 0x1fff.

PMT PID

Indicates the PID that carries this program's PMT. This field's interpretation depends on the program number.

When the program number is '0', this parameter indicates the network PID, thereby giving the PID of the transport stream packets containing the Network Information Table. The presence of the network PID and the NIT is optional.

When the program number is non-zero, this parameter indicates the PID of transport stream packets containing the Program Map Table.

PMT Version

Indicates the version number of this program's Program Map Table. This number changes whenever the PMT is updated.

VC

Indicates the number of the VC on which this program is located.

11.8.5 Status > TS Transmitters > Program > Elementary Stream Tab

Elementary Stream PID

Indicates the elementary stream PID.

Elementary Stream Type

Indicates the elementary stream type.

11.9 TS Demultiplexer Configuration

11.9.1 Config > TS Demultiplexers Table

Abstract: *The eight branches under the TS Demultiplexers branch each represent one of the TMX module's internal demultiplexer interfaces.*

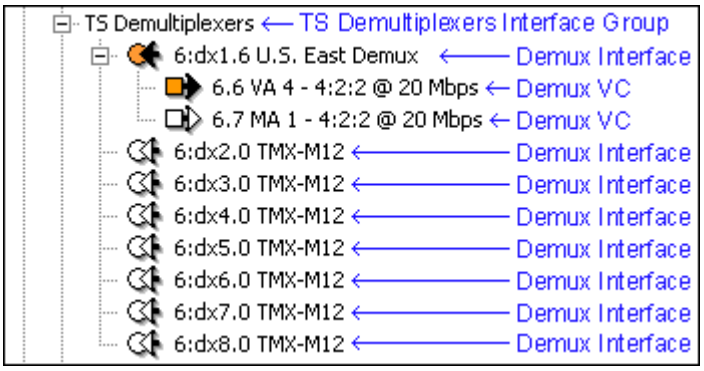

TS Demultiplexers ← TS Demultiplexers Interface Group
6:dx1.6 U.S. East Demux ← Demux Interface
6.6 VA 4 - 4:2:2 @ 20 Mbps ← Demux VC
6.7 MA 1 - 4:2:2 @ 20 Mbps ← Demux VC
6:dx2.0 TMX-M12 ← Demux Interface
6:dx3.0 TMX-M12 ← Demux Interface
6:dx4.0 TMX-M12 ← Demux Interface
6:dx5.0 TMX-M12 ← Demux Interface
6:dx6.0 TMX-M12 ← Demux Interface
6:dx7.0 TMX-M12 ← Demux Interface
6:dx8.0 TMX-M12 ← Demux Interface

Figure 11-3 The TS Demultiplexers Branch of the Navigation Tree

Each demultiplexer interface receives its signal through a Mux VC and can demultiplex a multi-program transport stream into individual programs. Each de-multiplexed program then can be routed to a separate Demux VC. Demux VC's, in turn, operate as cross connection sources.

Note: (1) For details about the colored icons shown in the navigation tree above, see the topic "Overview of Navigation Tree Icons" on page 180.
(2) The availability of the TMX's TS Receiver interface is governed by feature keying. See "TMX Module Types and Features" on page 481 for details.

Tag

This field indicates the tag assigned to each demultiplexer.

Enable Network Degrade Alarms

Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms

Use this control to enable Network Fault alarm notification. See "Network Fault Alarms" on page 495 for more information.

11.9.2 Config > TS Demultiplexers > Interface Tab

Abstract: *This tab summarizes settings for the selected TS Demultiplexer interface.*

Tag
This field indicates the tag assigned to this interface.

Active Virtual Channels
This row provides a count of the current number of active virtual channels on this interface.

Enable Network Degrade Alarms
Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms
Use this control to enable Network Fault alarm notification. See "Network Fault Alarms" on page 495 for more information.

Transport Stream

SI-PSI Mode
This field indicates the System Information (SI) table paradigm.

Input

Input Channel
This field indicates the channel providing input to this TS Demultiplexer.

Input Tag
This field indicates the tag assigned to the VC acting as input to this TS Demultiplexer

11.9.3 Config > TS Demultiplexers > Virtual Channel Tab

Abstract: *This table summarizes the settings of each virtual channel associated with the demultiplexer interface selected in the navigation tree.*

The fields in this dialog are identical to those of the "Config > TS Receivers > Demultiplexer VC Tab" on page 314. Please see the description of dialog for details.

11.10 Config TS Demultiplexer Dialog

11.10.1 Config > TS Demultiplexers > Interface Dialog

Control

Tag

Use this control to assign a tag to this demultiplexer interface.

Enable Network Degrade Alarms

Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms

Use this control to enable Network Fault alarm notification. See "Network Fault Alarms" on page 495 for more information.

Transport Stream

SI-PSI Mode

Use this control to specify the system information table paradigm.

DVB Process and preserve control tables for the Digital Video Broadcasting project. In particular, this allows the SDT on PID 17 and forwards it through the demultiplexer.

MPEG Process and preserve only generic MPEG control tables. Tables, such as the SDT, that are specific to a particular MPEG application may be discarded.

Input Channel 0

Tag

Indicates the tag assigned to the VC acting as input to this demultiplexer.

11.11 Config > TS Demultipexers > VC Control Branch

11.11.1 Config > TS Demultiplexers > VC Control Dialog

Abstract: *Use this dialog to create and manage VCs carrying the output of the selected demultiplexer interface.*

Entries

Lists all virtual channels (VCs) associated with the selected demultiplexer interface. Highlight any VC in the list of entries to see its current settings.

Control

Tag

Use this field to enter a descriptive tag uniquely distinguishing this virtual channel. The tag may be up to 31 characters long.

Pgm name

Use this field to enter or change the program name (mpeg name) of the incoming stream.

Function

Use this control to identify the function of this VC in the transport stream.

Conditional Access — Indicates that this VC carries conditional access information. Many transport streams carry conditional access data, supporting encryption services to protect a stream's contents. When a VC's function is set to this value, all conditional access PIDs, referenced in the conditional access table, are collected and sent through the VC. A demultiplexer interface may have no more than one conditional access VC.

Note: Each demultiplexer interface may have only one conditional access channel.

PID — Packets are extracted from the transport stream according to PID number and are carried on this VC. The PID number is specified using the PID control (also located on this page).
The following principles apply to this setting selection.
(1) When a PID is configured for individual extraction, its packets must not be routed through any other VC on the interface.
(2) No other VC should reference the PID for extraction from the multiplex, either explicitly or implicitly, otherwise an alarm is raised (VC Degrade - Configuration Error).
(3) This function supports 'unusual' applications and might require application engineering support to configure correctly. The VC carrying this single PID may be connected like a normal demultiplexer VC. Some destinations, such as decoders, are unlikely to process it successfully, but the system does not prevent the connections. The most useful destination is likely to be a multiplexer VC, whose function is set to insert a specific PID into a multiplex.

Program — Indicates that this VC carries a program extracted from the transport stream. Based on the channel's program number, the module uses the transport stream's PAT to find the program's PMT, collects the referenced PIDs, and sends those PIDs' packets through this VC.

Note: The VC's function setting is ignored under the following conditions.
(a) The VC's interface is an internal multiplexer sending its MPTS output through this VC.
(b) The VC's interface is an external receiver with pass through enabled.
(c) Some function values consume limited internal resources. If any constraints are violated, the module will declare an alarm (Module Degrade - Configuration Error).

Enable Fault Alarms

Check this box to enable the NetVX to notify of signal fault alarm events for this virtual channel.

Enable Degrade Alarms

Check this box to enable the NetVX to notify signal degrade alarm events for this virtual channel.

See the topic "VC Degrade Alarms" on page 504 for details.

Policing Rate

Use this control to specify the policing behavior for this VC.

0 Data is allowed up to the maximum rate permitted by the interface.

1 to 214 Data is policed at the rate specified. Data are dropped if this rate is exceeded.

Program Number

Use this control to select the program, in the incoming multi-program transport stream, that you wish to direct to the highlighted VC. The module strips null packets from any programs brought in through this interface.

Drop Conditional Access

Enables/disables the disposal of Conditional Access (CA) data on this VC.

enable Directs the VC to discard all CA information. Specifically, the Entitlement Control Message (ECM) stream, and any CA descriptors, referenced through the PMT.

disable (default) Allows the VC to pass CA information intact.

PID

Specifies the packet identifier (PID) associated with this VC. When the channel's 'Function' is set 'PID', the packet identifier specifies which packets to extract from the interface's transport stream. Other VC functions ignore this setting.

-1 (Default) A PID of this value cannot occur in a transport stream. If the channel is configured for single-PID processing, this gives a 'safe' default value that cannot match any packets (and thus avoids duplicating a PID in an active program). Additionally, channels configured for other functions use -1 to indicate the absence of specific PID extraction.

0 Warning: Do not use this value. Using this value causes the TMX module to extract the stream's program allocation table (PAT) and disables program processing.

1 to 8190 Packets from the specified input PID are remapped to PID 42 before transferring them through the VC. When processing a full program from a multiplex, the system remaps the program number to 1 and all the PIDs starting at 32. For a full program, PID 42 corresponds to the first assigned data PID within the program. Because a single-PID channel normally would carry data, we remap the designated input PID to 42. For symmetry, a multiplexer VC that inserts a single PID also uses packets from PID 42.

New

To activate a new VC, highlight an unused VC entry and press this button.

Delete

To delete a VC, highlight a configured VC entry and press this button.
This field indicates this VC is now available by changing its tag back to '-- unused --'.

11.11.2 Config > TS Demultiplexers > VC Control Dialog > Program, Audio Filter Dialog

Abstract: *Use the controls in this dialog to filter unwanted audio channels from the program stream.*

Entries

Lists all virtual channels (VCs) associated with the selected demultiplexer interface. Highlight any VC in the list of entries to see its current settings.

Audio Services to Preserve

The grid of check boxes shown in this dialog represent the maximum number of audio programs that may be associated with a video program. The order of this list corresponds to the order in which associated audio program are listed in the Program Map Table (PMT).

Check boxes corresponding to audio PMT entries that you want to keep in the stream. Entries corresponding to unchecked boxes are dropped from the stream.

Related Procedures

- See Section 3.2.3, "How to Decode MPEG-2 Material" on page 65.
- See Section 3.5.4, "How to Associate Audio Channels with an Encoding Program" on page 77.
- See Section 3.5.3, "How to Configure a Standalone Audio Decoding Channel" on page 76.
- See Section 3.5.6, "How to Filter Audio Channels From a Program Stream" on page 81.

11.11.3 Config > TS Demultiplexers > VC Control Dialog > Program, Data Filter Dialog

Abstract: *Use the controls in this dialog to filter unwanted data channels from the program stream.*

Entries

Lists all virtual channels (VCs) associated with the selected demultiplexer interface. Highlight any VC in the list of entries to see its current settings.

Data Services to Preserve

The grid of checkbox shown in this dialog represent the maximum number of data programs that may be associated with a video program. The order of this list corresponds to the order in which associated data services are listed in the Program Map Tables (PMT).

Check boxes corresponding to data PMT entries that you want to keep in the stream. Entries corresponding to unchecked boxes are dropped from the stream.

Related Procedures

See Section 3.4.2 "How to Filter Data Channels From a Program Stream" on page 71

11.12 TS Demultiplexer Status

11.12.1 Status > TS Demultiplexers Table

Tag
Indicates the tag assigned to the respective demultiplexer interface.

System Information Present
Indicates if system information tables are present in the transport stream.

Input

Input Channel
Indicates the VC providing input to the respective demultiplexer interface.

Input Tag
Indicates the tag assigned to the VC acting as input to this demultiplexer.

Packets
Provides a count of packets received on this interface after policing (if policing is necessary).

TS Rate (Mbps)
Indicates the computed transport stream bitrate for this channel.

11.12.2 Status > TS Demultiplexers > Interface Tab

System Information Present
Indicates if system information tables are present in the transport stream.

Input

Input Channel
Indicates the VC providing input to the respective demultiplexer interface.

Input Tag
Indicates the tag assigned to the VC acting as input to this demultiplexer.

Packets
Provides a count of packets received on this interface after policing (if policing is necessary).

TS Rate (Mbps)
Indicates the computed transport stream bitrate for this channel.

11.12.3 Status > TS Demultiplexers > Virtual Channel Tab

This table summarizes the status of each virtual channel on the selected interface.

Packets

Maintains a count of the number of packets transmitted over this VC.

TS Rate (Mbps)

Indicates the rate at which data are transmitted over this VC.

Program

Program Present

Indicates if any programs are detected within the stream being transmitted by this VC.

Packets Dropped

Provides a count of the number of packets discarded for this VC.

Failure

Indicates processing failure on this VC. When a VC is configured for special function processing, several conditions can cause a failure. If the module encounters processing errors, it will declare an alarm (vcDeg, transport stream errors). The utility clear command resets this value to noFault.

No Fault	Indicates processing appears to be operating properly.
Fault	Indicates the VC appears to be operating improperly.
Unknown	Indicates the module cannot determine the status of this VC.

SI-PSI Continuity Counter Errors

Maintains a count of the number of System Information continuity count errors detected on this VC.

SI-PSI CRC Errors

Maintains a count of the number of System Information CRC errors detected on this VC.

11.12.4 Status > TS Demultiplexers > Program Tab

Program

Provides an index number for each program located in the transport stream.

Name

Indicates the name for this program, as obtained from the MPEG stream. Typically, this value is inserted by an encoder or another entity that creates transport streams.

PCR PID

Indicates the PID that carries this program's PCRs. If the program does not have PCRs, this parameter takes on the value 0x1fff.

PMT PID

Indicates the PID that carries this program's PMT. This field's interpretation depends on the program number.

When the program number is '0', this parameter indicates the network PID, thereby giving the PID of the transport stream packets containing the Network Information Table. The presence of the network PID and the NIT is optional.

When the program number is non-zero, this parameter indicates the PID of transport stream packets containing the Program Map Table.

PMT Version
Indicates the version number of this program's Program Map Table. This number changes whenever the PMT is updated.

VC
Indicates the number of the VC on which this program is located.

11.12.5 Status > TS Demultiplexers > Program> Elementary Stream Tab

Elementary Stream PID
Indicates the elementary stream PID.

Elementary Stream Type
Indicates the elementary stream type.

11.13 TS Multiplexer Configuration

11.13.1 Config > TS Multiplexers Table

Abstract: *The eight branches under the TS Multiplexers branch each represent one of the TMX module's internal multiplexer interfaces.*

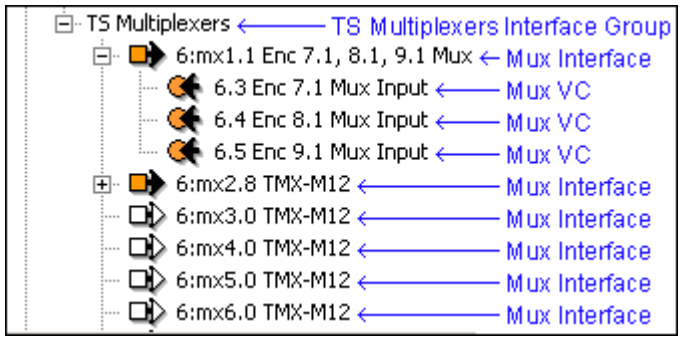


Figure 11-4 The TS Multiplexers Branch of the Navigation Tree

Each TS Multiplexer interface can multiplex up to 63 Mux VCs to provide a multi-program transport stream (MPTS) on a Demux VC. The demux VC can be cross-connected to other modules that have the capability to operate with a MPTS input.

The table on the right provides a column of the following information about each of the system's multiplexer interfaces.

Note: For details about the colored icons shown in the navigation tree above, see the topic "Overview of Navigation Tree Icons" on page 180.

Tag

This field indicates the tag applied to this multiplexer interface.

SI-PSI Mode

This field indicates the system information table paradigm specified for the transport stream leaving this interface.

Transport Stream ID

This field indicates the transport stream ID specified for this interface.

Data Carousel Streaming

This field indicates if the data carousel is configured to stream through this interface.

Data Carousel Rate

This field indicates maximum bit rate available to this interface's data carousel.

Network Degrade

This field indicates if network degrade alarm signaling is active for this interface.

11.14 TS Multiplexer Branch

11.14.1 Config > TS Multiplexers > Interface Tab

Abstract: *The fields in this tab summarize settings for the selected Transport Stream multiplexor interface.*

Tag
Indicates the tag applied to this multiplexer interface.

Active Virtual Channels
Indicates the current number of active virtual channels on this interface.

Network Degrade
Indicates if network degrade is enabled for this interface.

Transport Stream

Transport Stream ID
Indicates the transport stream ID specified for the multiplexed output of this interface.

SI-PSI Mode
Indicates the system information table paradigm specified for the transport stream leaving this interface.

Carrier Frequency (MHz)
Indicates the ATSC carrier frequency for this stream.

Network ID
Indicates the DVB network identifier for this stream.

Delivery System Descriptor
This hexadecimal descriptor sets several settings required to support cable, or satellite, or terrestrial transmission methods.

Output

Output Channel
Indicates the Virtual Channel carrying the output of this multiplexer.

Output Tag
Indicates the tag assigned to the output channel of this multiplexer.

Data Carousel Streaming
Indicates if streaming is enabled

Data Carousel Rate
Indicates the rate, in Mbps, at which the data carousel is configured to operate.

11.14.2 Config > TS Multiplexers > Virtual Channel Tab

Abstract: *This table summarizes the settings of each virtual channel associated with the multiplexer interface selected in the navigation tree. These VCs act as input to the multiplexer interface.*

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog(s).

The fields in this tab are identical to those in the "Config > TS Transmitter > Multiplexer VC Tab" on page 322. Please see the description of that dialog for details.

11.15 TS Multiplexer Dialogs

11.15.1 Config > TS Multiplexers > Interface Dialog

Control

Tag
Use this field to enter a descriptive tag uniquely distinguishing this virtual channel. The tag may be up to 31 characters long.

Data Carousel Rate
Specify the data carousel rate here.

Enable Network Degrade Alarms
Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Data Carousel Streaming
Check this box to enable carousel streaming on this interface.
See "How to Configure Carousel Directories and Files" on page 125 for details.

Output Channel

'Channel #' indicates the number of the VC carrying the output of this multiplexer.

Tag
Indicates the tag of the channel receiving this channel's output.

Policing Rate *
Use this control to specify the policing behavior for this interface.

0	Data is allowed up to the maximum rate permitted by the interface.
1 to 214	Data is policed at the rate specified. Data are dropped if this rate is exceeded.

Note: Each internal multiplexer interface uses one or more Multiplexer VCs as inputs and one (and only one) Demux VC as an output. Therefore the 'Policing Rate' described above is actually the policing rate of the Demux VC associated with the interface.

11.16 Config > TS Multiplexers > VC Control Branch

11.16.1 Config > TS Multiplexers > VC Control Dialog

Abstract: *Use this dialog to create and manage VCs carrying input to the selected multiplexer interface.*

Note: This dialog is identical to the "Config > TS Transmitter > VC Control Dialog" described on page 338.

Entries

Provides a list of all VCs associated with the selected multiplexer interface. Highlight any VC in the list of entries to see its current settings.

Control

Tag

Use this field to enter a descriptive tag uniquely distinguishing this virtual channel. The tag may be up to 31 characters long.

Enable Degrade Alarms

Check this box to enable the NetVX to notify of signal degrade alarm events for this virtual channel.

See the topics "Overview of NetVX Alarms" on page 214 and "VC Degrade Alarms" on page 504 for more details.

Enable Fault Alarms

Check this box to enable the NetVX to notify of signal fault alarm events for this virtual channel.

Use Hexadecimal PIDs

This control is a global control affecting the presentation of PID (and some other) values. Some standards, practices require users to interact with actual he xi decimal values, while others do not. Use this checkbox to affect the presentation of he xi decimal values.

Checked Vidiem presents he xi decimal values as such.

unchecked Vidiem presents he xi decimal values as decimal values. Internally the system ‘does the right thing’ with these values according to specifications, etc.

Function

Use this control to specify the function of this VC in the multiplexed transport stream.

Conditional Access This VC will carry conditional access information. Many transport streams carry conditional access data, supporting encryption services to protect a stream's contents. When a VC's function is set to this value, the PIDs referenced in the VC's input conditional access table are multiplexed into the transport stream for the referenced interface, and the conditional access table is constructed appropriately. A multiplexer interface may have no more than one conditional access VC.

PID This VC insert a single PID's packets into the transport stream. The module isolates the selected packets (see the VC's packet identifier for details), drops all other packets in the VC (if any), remaps the selected packets to the VC's PID, and inserts those packets into the interface's multiplex. The PID is not added to the PAT or any PMT. When a PID is configured for individual insertion, no other VC on the same interface should insert packets on that PID, either explicitly or implicitly. The module asserts an alarm (VC Degrade - Configuration Error) if this constraint is violated.
Note: This function supports ‘unusual’ applications and might require application engineering support to configure correctly. The VC inserting this single PID may be connected like a normal multiplexer virtual VC. The most useful source is likely to be a demultiplexer VC, whose function is set to extract a specific PID from a multiplex.

Program Use this setting to multiplex the program carried on this VC into the transport stream. The module builds the transport stream's PAT based on the VC's program number. The transport stream is provided on the specified interface.

Note: A multiplexer interface may have no more than one conditional access channel.

Program Number

Use this control to specify the program number that shall identify the program on this VC in the multiplexed multi-program transport stream (MPTS).

0 Data enter the multiplex through this VC without adding a PAT entry. Use this selection to add Program and System Information Protocol (PSIP) data to the transport stream.

1 to 509 Specifies the program number assigned to data entering to the MPTS from this VC.

Protection Level

Note: This control is disabled on internal multiplexer interfaces, but enabled on TS Transmitter interfaces. See "Config > TS Transmitter > VC Control Dialog" described on page 338 for a complete description of this control.

Specifies this VC's protection level. This parameter applies only to channels assigned to a transmit interface. If the transmit rate is about to be exceeded (leading to transmit buffer overflow), the interface discards packets from 'low' VCs to avoid dropping packets from 'high' VCs. The interface will drop 'high-priority' traffic if necessary, but only after dropping all 'low-priority' packets.

Note: (1) Any dropped packet, whether high or low protection, contributes to a 'transmit buffer overflow' alarm.
(2) This parameter requires the interface not to be operating in 'pass-through' mode.
(3) This parameter requires the interface not to be operating in 'SI Mode' set to either 'ISDB' or 'MPH'.
(4) This parameter requires the interface not to be operating a 'StatMux' group.

New (button)

Press this button to create a new VC.

Delete (button)

Highlight a VC and press this button to delete it.

11.16.2 Config > TS Multiplexers > VC Control > Program, Details Dialog

Current Function

See the "Function" control on page 363

Program Number

See the "Program Number" control on page 364

TS Rate

Specifies the rate for this virtual VC. When multiplexing a transport stream, the individual contributing VCs have bandwidths established by their sources. Depending on the VC's function, this rate lets the system enforce an upper bound on a program's total transport stream bandwidth without affecting other programs in the multiplex.

0 Disables policing and transrating.

1 to 214 Specifies the maximum transport stream rate.

Drop Conditional Access

Enables/disables the disposal of Conditional Access (CA) data on this VC.

enable Directs the VC to discard all CA information. Specifically, the Entitlement Control Message (ECM) stream, and any CA descriptors, referenced through the PMT.

disable (default) Allows the VC to pass CA information intact.

Descriptors

Specifies the descriptor carried by this VC. Descriptors have the following format. Two pairs of two-digit hex values separated by colons.

Tag The descriptor tag, as detailed in the MPEG specification (ITU-T Rec. H.222.0, Section 2.6, Table 2-39)

Length Indicates the length of the Descriptor Data field (below) in bytes.

Data N-bytes of Descriptor Data.

The VC's 'Function' and 'Program Number' affect the way that the descriptor is treated as described in Table 11-3 below.

Table 11-3 VC Descriptor Processing Based on VC Function and Program Number

MX VC Function	Program Number	
ca	ignored	The descriptor is discarded
pid	0	Discard the descriptors. The selected PID's packets are inserted into the transport stream, but the PID is not added to the PAT or any PMT.
pid	non-zero	First, identify the channel carrying the indicated program by matching the program number. Then insert the descriptors at the element level in the PMT, associated with this channel's program element entry.
program	any	Insert the descriptors at the program level in the PMT, not associated with any particular program element.

Omit Logical Channel Descriptor (checkbox - DVB mode only)
Preserve Stream's Channels (checkbox - non-DVB mode)

Check this box to specify major and minor channel numbers.

Checked The major and minor channels in the input stream are preserved.

Unchecked Specify the major and minor channel numbers (below) for the program entering the multiplex through this VC. Use this option when you want change the major and minor channel numbers from those present in the incoming stream.

Major Channel/Minor Channel Numbers

Note: The following settings are enabled only when the transport stream's SI-PSI mode is set to 'ATSC'. This setting is configured in the "Overview of NetVX Alarms" on page 214'

Use these fields to specify the ATSC major and minor channel numbers for the program entering the multiplex through this VC. The interface's SI-PSI Mode must be set to 'ATSC' in order to edit these fields. Other SI modes ignore this value.

0 If the incoming MPEG stream for this VC also carries a VCT (and it normally should), zero instructs the multiplexer to preserve the program's major and minor channel numbers in the multi-program transport stream of the associated interface.

1-99, 1-999 The VCT's range is 1 to 99 (for terrestrial) and 1 to 999 (for cable). A non-zero major channel number tells the multiplexer to use the VC's configured major and minor channel values in the output VCT.

Visible Service Flag (checkbox)

(This control is only active in DVB mode)

11.16.3 Config > TS Multiplexers > VC Control > Program, Statmux Dialog

Function

See the "Function" control on page 363

Enable StatMux

Enables/disables this VC's participation in the TS transmitter's stat mux group. Given typical video input, MPEG encoding needs varying bandwidth over time to maintain consistent picture quality. Statistical multiplexing lets a group of programs take advantage of these bandwidth peaks and valleys. A program that encounters easy material can 'donate' its extra bandwidth to other programs that are coding more difficult video. See Section 3.9.4 "How To Configure StatMux for Locally-Encoded Programs" on page 104.

Priority

Specifies this VC's priority within its statistical multiplexing group.

The NetVX uses this value as it adjusts picture quality among StatMux Group members. VCs with a lower priority values are considered higher priority and receive preference. The value is meaningful only when compared with other VCs in its statistical multiplexing group. See Section 3.9.8 "How to Configure Default PID Values" on page 114

1-10 '1' gives this VC highest priority and '10' the lowest.

5 Default setting.

Maximum Rate (Mbps)

Specifies the maximum rate to which the StatMux algorithm can increase the TS Rate for this VC. When a VC participates in a statistical multiplexing group, this parameter helps control the bandwidth allocation (and picture quality) for the VC. Setting a maximum bitrate limits the bandwidth allocation for a particular VC.

This parameter is typically used to limit the amount of bandwidth a VC can 'borrow' from other StatMux group members, when it carries less important material. The VC can be given less bandwidth than the maximum value.

When a statistically multiplexed VC is connected to a local encoder, the system can enforce additional constraints on the statmux bandwidth. These constraints can be enforced dynamically, because the cross connections might be unknown when a VC's maximum value is configured. The system can reduce a VC's working maximum below the configured value, if it decides that is necessary. See Section 3.9.8 "How to Configure Default PID Values" on page 114.

0 The maximum bitrate is unconstrained. This gives the system the most latitude to improve overall picture quality of the group, perhaps at the momentary expense of individual group members.

1 to 15 Range of rates for Standard-Definition encoders.

7 to 80 Range of rates for High-Definition encoders.

Target Rate (Mbps) (Deprecated in release 5.1)

This calculated field presents the StatMux algorithm's target TS Rate for this program. The target bit rate for any VC in a StatMux group is calculated by taking into account the bit rate and the priority settings for every program in the StatMux group.

The calculation used to reach the target bit rate is described in detail in Section 3.9.2, "Overview of the StatMux Priority Control" on page 101.

Minimum Rate (Mbps)

Specifies the minimum rate to which the StatMux algorithm can decrease the TS Rate for this VC. When a VC participates in a statistical multiplexing group, this parameter helps control the bandwidth allocation (and picture quality) for the VC. This value helps VCs avoid bitrate 'starvation' thus preserving a certain level of picture quality regardless of the activity on other VCs in the group. The VC can also be given more bandwidth than the minimum value.

When a statistically multiplexed VC is connected to a local encoder, the system can enforce additional constraints on the statmux bandwidth. These constraints can be enforced dynamically, because the cross connections might be unknown when a VC's minimum value is configured. The system can increase a VC's working minimum above the configured value, if it decides that is necessary. See Section 3.9.8 "How to Configure Default PID Values" on page 114.

0 The minimum bitrate is unconstrained. This gives the system the most latitude to improve overall picture quality of the group, perhaps at the momentary expense of individual group members.

1 to 15 Range of rates for Standard-Definition encoders.

7 to 80 Range of rates for High-Definition encoders.

Distributed Control

IP Address

Specifies the IP address for a distributed encoder in a statmux group. A statistical multiplexing group receives input through the statmux VCs for its interface.

Until release 7.3.0 all statmux VCs had to be connected to a 'local' encoder. 'Local' meaning an encoder residing in the same system as the TMX module.

Beginning with release 7.3.0, the encoder can reside in another system, connected to this control module through some external communication path (ATM, ethernet, etc.).

0.0.0.0 A value of zero means the channel has a local source.

#.#.#.# A non-zero IP address indicates this channel is connected to an encoder in an external NetVX system. Together, this IP address and the slot number identify the remote system and encoder supplying this channel's transport stream.

Note: (1) Both the IP address and the Slot number (described below) must be non-zero to fully identify an external encoder.
(2) This parameter is ignored if the VC is not part of a StatMux Group.

Slot

Specifies the slot number for a distributed encoder in a statmux group.

0 Indicates no distributed encoder is used.

1–17 Specifies the slot in which the distributed encoder is located.

Note: This parameter is ignored if the VC is not part of a StatMux Group.

11.16.4 Config > TS Multiplexers > VC Control > Program, PID Mapping Dialog

Abstract: *This dialog is provided for expert users who thoroughly understand PID mapping rules and desire to customize their transport streams.*

⚠ WARNING!

Warning: The Vidiem™ Element Management System automatically assigns (maps) PIDs to ensure that there are no PID collisions in the transport stream it creates. Only expert users should use the controls in this dialog as manually mapping PIDs increases the possibility of creating PID collisions.

PID Map

Use this control to specify whether PIDs in programs on this interface should be mapped 'Automatically' or 'Manually'.

Automatic The interface uses the VC's program number to determine a base PID value. It then assigns a group of 16 PIDs to the program as described in Table 11-4 below.

Note: In the case where the mutliplexer is creating an ISDB-Tb stream, the PMT PID is configured according to STANDARD SBTVD N08-3 section 25.4 (Partial reception layer PMT PID). This standard specifies PMT values as described in Table 11-2, "Relationship Between Service Number Options and PMT PID Values for ISDB-Tb Mobile Streams" on page 340.

NetVX requires all program number assignments to be unique. Therefore, when unique program numbers are applied to this formula, unique PID assignments for every elementary stream contributing to the MPTS can be assured.

Automatic mode allocates blocks of 16 PIDs. PIDs from 48 through 4095 (0xFFF) form a primary allocation pool, used exclusively for programs 1 through 253 (as described for the base_pid above).

PIDs in the range from 4096 (0x1000) through 7167 (0x1BFF) form a secondary allocation pool. Programs 254 through 65535 allocate 16-PID blocks as needed. Any program that needs more than 16 PIDs also receives PIDs from this secondary pool (this includes both programs 1 to 253 and programs 254 to 65535).

See "How to Configure Default PID Values" on page 114 for more details.

⚠ WARNING!

Warning: All PIDs from the secondary pool (described above) are allocated dynamically. This approach can cause PID assignments to change across system resets, module re-configuration, etc. Although each program's PMT would reflect such changes, some applications might have trouble dealing with unpredictable nature of this behavior. Those applications could use manual PID assignments, described below.

Manual In manual mode, each VC specifies its own PID values, using the configuration values in the VC's program group.
MPEG defines a packet identifier as a 13-bit number, reserving 0 through 15 and 8191 (0x1FFF). The ATSC standard further reserves PIDs below 48. Moreover, the ATSC program guide (PSIP) tables conventionally use PIDs at 7680 (0x1E00) and above. The automatically assigned values avoid these ranges, using values from 48 to 7167 (0x1BFF).
All PIDs for the interface must be unique. If a VC tries to use a PID that has already been assigned on the same interface, the VC will declare a VC Degrade – Configuration Error Alarm.
See "How to Manually Map VC PID Values on a Mux Interface" on page 115 for more details.

Table 11-4 Automatic PID Mapping Formula Example Based on ATSC Recommendations

PID Type	PID-Calculation Formula	Example	PID #
Program Number	#	4	–
PMT (Base) PID [1]	48+16*(Program Number - 1)	48 + 16 * (4 - 1) = 96	96
Video PID	Base PID + 1	96 + 1	97
PCR PID	Base PID + 2	96 + 2	98
Audio 1 PID	Base PID + 3	96 + 3	99
Audio 2 PID	Base PID + 4	'1' is added for each subsequent Audio PID.	100
Data 1 PID	Base PID + 11	96 + 11	107
Data 2 PID	Base PID + 12	'1' is added for each subsequent Data PID.	108
ECM 1 PID	Base PID + 14	96 + 14	110
ECM 2PID	Base PID + 15	'1' is added for each subsequent ECM PID.	111

[1] The PMT PID value is different for ISDB-Tb Streams and is affected by the Service Number. See Table 11-2, "Relationship Between Service Number Options and PMT PID Values for ISDB-Tb Mobile Streams" on page 340 for details.

Audio Base PID

Specifies the initial (or 'base') packet identifier (PID) value to apply to packets carrying audio. If the program has multiple audio streams, subsequent PID values are assigned consecutively.

Data Base PID

Specifies the initial (or 'base') packet identifier (PID) value to apply to packets carrying data. If the program has multiple data streams, subsequent PIDs are assigned. Data services such as VBI, teletext, and ancillary data might appear to come and go in the input signal to an encoder. The NetVX encoders may used fixed offsets from this base data PID, giving data services fixed PIDs in the transport stream.

ECM Base PID

Specifies the initial (or 'base') packet identifier (PID) value to apply to packets carrying the stream's ECM (Entitlement Control Message) data. If the program has multiple ECM streams, subsequent PIDs are assigned consecutively.

PCR PID

Specifies the packet identifier to apply to packets carrying PCRs. An encoder can use or ignore this parameter. If the encoder has been configured to transmit PCRs on the Video PID (combined), it ignores the PCR PID value. Alternatively, the encoder can generate PCRs on a distinct PID (separate), and this pcrPid value gives that packet identifier. Either way, the system's PCR PID value should be distinct from the system's Video PID (vidPid).

When de-multiplexing transport streams, this parameter's value is used as necessary. The demultiplexer examines the incoming program to see if the PCR PID noted in the PMT matches a value in the PMT's stream table. If so, the demultiplexer automatically remaps the PCR PID value in the PMT to match the referenced stream (audio, video, etc.), and this pcrPid parameter is ignored. If the incoming PMT's PCR packet identifier does not match a stream in the PMT loop, this parameter's value gives the packet identifier for the outgoing program's remapped PCR PID. Finally, if the incoming program has no PCRs (indicated with a PCR PID value of 8191 in the PMT), the demultiplexer preserves 8191 in the outgoing program's PMT.

PMT PID

Specifies the packet identifier to apply to packets carrying the PMT.

Video PID

Specifies the packet identifier to apply to packets carrying video.

11.16.5 Config > TS Multiplexers > VC Control > PID Insertion Dialog

Function

See the "Function" control on page 363

PID

Specifies the packet identifier associated with this VC. When the VC's 'Function' is set to 'PID' the packet identifier specifies the PID to use for packets inserted from this VC into the interface's transport stream. Other functions ignore the packet identifier value.

-1 (Default) A PID of this value cannot occur in an MPEG stream. If the VC is configured for single-PID processing, this gives a 'safe' default value that explicitly avoids insertion for the VC. Additionally, VCs configured for other functions can use -1 to indicate the absence of specific PID insertion.

0 Warning: Do not use this value. PID value zero carries the program association table (PAT). This table provides information describing individual programs for the transport stream. The prohibition on supplying a PID from multiple sources also applies to the PAT. Though the PAT's PID could be inserted individually, this would generally be inadvisable for most applications (where the module itself builds the PAT and inserts it into the transport stream).

1 to 8190 Packets from the VC's PID 42 are remapped to the specified PID before transferring them to the interface. When processing single programs, the system uses program 1 and starts the PIDs at 32. For a full program, PID 42 corresponds to the first assigned data PID within the program. Because a single inserted PID normally would carry data, the input PID 42 is remapped to the configured PID value and those packets are inserted into the multiplex. For symmetry, a demultiplexer VC that extracts a single PID also maps its packets to PID 42.
When generating the interface's transport stream, packets for a particular PID should be inserted from no more than one VC, either explicitly by using the 'PID' function, or implicitly by using other function values. For example, if another VC supplies a program (specified through the function and program number) that contributes a PID to the multiplex, that packet identifier should not additionally be inserted by itself.

Insertion Program

Use this control to specify the program into which this PID shall be inserted.

Stream Type

Specifies the stream type for this channel's program element. This 8-bit field specifies the type of the program element carried in the transport stream packets. See the MPEG specification (ITU-T Rec. H.222.0, Section 2.4.4.9, Table 2-29) for details on the stream type.

0 Configuring the VC's type as zero (a reserved value in the MPEG specification) tells the system to preserve any type already associated with the channel.

non-zero A non-zero value explicitly sets (or replaces) the channel's stream type.

This value applies only when the channel inserts a single program element into a program of the transport stream, such as when the function is 'PID' and the program number is non-zero. In this case, the stream type should be non-zero; the channel asserts an alarm otherwise (vcDeg, configuration error). A channel that carries multiple program elements (a function of program, for example), does not use the stream type value.

Descriptors (0x)

See Section "Descriptors" on page 365.

Create Descriptor

Descriptor Type (Drop Down)

Select the desired descriptor type from the list.

Subtitling Select this option to add subtitling descriptors to the stream [only current option].

Create (Button)

Opens the 'Subtitling Descriptor Dialog' see Section 11.16.6, "Subtitling Descriptor Dialog" on page 372 for details.

11.16.6 Subtitling Descriptor Dialog

Abstract: *Use this dialog to specify properties for ETSI EN 300 743 V1.3.1 (2006-07)-compliant subtitling descriptors.*

ISO Language Code

Specifies the ISO language code for this descriptor.

Subtitling Type

Choose the desired type of subtitling for this descriptor.

0x10	Normal with no aspect ratio.
0x11	Normal with 4:3 aspect ratio.
0x12	Normal with 16:9 aspect ratio.
0x13	Normal with 2.21:1 aspect ratio.
0x20	Hard of hearing with no aspect ratio.
0x21	Hard of hearing with 4:3 aspect ratio.
0x22	Hard of hearing with 16:9 aspect ratio.
0x23	Hard of hearing with 2.21:1 aspect ratio.

Composition Page ID (0x)

Use this control to specify the hexadecimal value for the Composition Page ID. The composition page* conveys '...subtitle elements for one specific subtitle service.'

Ancillary Page ID (0x)

Use this control to specify the hexadecimal value for the Ancillary Page ID. The ancillary page* conveys, '...subtitle elements that may be shared by multiple subtitle services within a subtitle stream.'

* Both quotes from: ETSI EN 300 743 V1.3.1 (2006-07)

11.17 Scramblers

11.17.1 Config > Scramblers > SCR Properties Dialog

Entries
Each entry in this list represents a Scrambler VC.

Tag
Use this field to create apply a name to the Scrambler VC.

Program Number
Use this control to specify the Program Number for this VC.

Simulcrypt Scrambling Control Group
Use this control to specify the SCG for this VC.

New (button)
Click this button to create Scrambler VC entry.

Delete (button)
Highlight an entry and click this button to delete the selected Scrambler VC entry.

Related Topics

"How to Configure the NetVX to Use Conditional Access" on page 116.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG Dialog" on page 225.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA SCG > ECM Dialog" on page 226.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System Dialog" on page 227.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > ECMG Dialog" on page 228.
"Config > System > CA SCGs (or) CA Systems > CA SCG # > CA Properties > CA System > EMMG Dialog" on page 228.

11.18 TS Multiplexer Status

11.18.1 Status > TS Multiplexers Table

Abstract: *This table summarizes the status of each multiplexer (MX) interface in the system.*

Tag
Indicates the tag assigned to this multiplexer interface.

Output

Output Channel
Indicates the number of the VC carrying the output of this multiplexer.

Output Tag
Indicates the tag of the VC carrying the output of this multiplexer.

Packets Dropped
Maintains a count of the number of packets dropped by this VC.

Packets
Maintains a count of non-null transport stream packets received on this interface.

TS Rate (Mbps)
Indicates the computed transport stream bitrate on this channel.

Data Carousel Status

Data Carousel Packets
Maintains a count of packets inserted from this interface's data carousel.

Data Carousel Rate (Mbps)
Indicates the computed transport stream bitrate for the interface's data carousel. Regardless of the configured bitrate, this value provides the actual rate at which carousel data are being inserted into the transport stream.

Current Data Carousel Identification
Identifies the interface's current data carousel file. This value is derived from the File Description descriptor in the carousel file. If no file has been loaded into the current carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Current Data Carousel Start Time
Indicates the start time of the interface's current data carousel file. The value is a text string, representing the designated date and time in ISO 8601 format. The time might be in the past or the future. If the carousel file does not have an Activation Time descriptor, the system uses the time at which the file became current. If no file has been loaded into the current carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Current System Time
Provides convenient access to the current system time for comparison with the 'Current Data Carousel Start Time' shown above.

Late Data Carousel Packets
Provides a count of late packets inserted from this interface's data carousel.

Next Data Carousel Identification

Identifies the interface's next data carousel file. This value is derived from the File Description descriptor in the carousel file. If no file has been loaded as the next carousel, this parameter indicates ‘none’. The state of the carousel streaming does not affect this variable.

Next Data Carousel Start Time

This field indicates the time at which the next data carousel shall begin streaming.

11.18.2 Status > TS Multiplexers > Interface Tab

Abstract: *This table summarizes the status of the multiplexer interface highlighted in the status navigation tree.*

Output Channel
Indicates the number of the VC carrying the output of this multiplexer.

Output Tag
Indicates the tag of the VC carrying the output of this multiplexer.

Packets Dropped
Maintains a count of the number of packets dropped by this VC.

Packets
Maintains a count of non-null transport stream packets received on this interface.

TS Rate (Mbps)
Indicates the computed transport stream bitrate on this channel.

PAT Version
Indicates the PAT version number for this interface's transport stream. The Program Association Table carries a 5-bit field that changes whenever the PAT definition changes.

Transport Stream ID
Indicates the transport stream ID for this interface. This 16-bit value identifies a transport stream from any other multiplex within a network. Zero indicates the TSID is unavailable.

Data Carousel Status

This field indicates if the carousel is experiencing a fault.

Data Carousel Packets
Maintains a count of packets inserted from this interface's data carousel.

Data Carousel Rate (Mbps)
Indicates the computed transport stream bitrate for the interface's data carousel. Regardless of the configured bitrate, this value provides the actual rate at which carousel data are being inserted into the transport stream.

Current Data Carousel Identification
Identifies the interface's current data carousel file. This value is derived from the File Description descriptor in the carousel file. If no file has been loaded into the current carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Current Data Carousel Start Time
Indicates the start time of the interface's current data carousel file. The value is a text string, representing the designated date and time in ISO 8601 format. The time might be in the past or the future. If the carousel file does not have an Activation Time descriptor, the system uses the time at which the file became current. If no file has been loaded into the current carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Late Data Carousel Packets
Provides a count of late packets inserted from this interface's data carousel.

Next Data Carousel Identification

Identifies the interface's next data carousel file. This value is derived from the File Description descriptor in the carousel file. If no file has been loaded as the next carousel, this parameter indicates ‘none’. The state of the carousel streaming does not affect this variable.

Next Data Carousel Start Time

This field indicates the time at which the next data carousel shall begin streaming.

11.18.3 Status > TS Multiplexers > Multiplexer VC Tab

Packets

Provide a count of the number of transport stream packets carried by this VC.

TS Rate

Indicates the current 'TS Rate' being used by this interface.

Program

This field indicates the program number identifying this program in the multiplexed stream created by this interface.

Program Present

Indicates whether or not a program is present on the VC.

VC Failure

Indicates processing failure on this VC. When a VC is configured for special function processing, several conditions can cause a failure. If the module encounters processing errors, it will declare an alarm (vcDeg, transport stream errors). The utility clear command resets this value to noFault.

No Fault	Indicates processing appears to be operating properly.
Fault	Indicates the VC appears to be operating improperly.
Unknown	Indicates the module cannot determine the status of this VC.

SI-PSI Continuity Count Errors

Provides a running-count of these errors.

SI-PSI CRC Errors

Provides a running-count of these errors.

11.18.4 Status > TS Multiplexers > Program Tab

Program

Provides an index number for each program located in the transport stream.

Name

Indicates the name for this program, as obtained from the MPEG stream. Typically, this value is inserted by an encoder or another entity that creates transport streams.

PCR PID

Indicates the PID that carries this program's PCRs. If the program does not have PCRs, this parameter takes on the value 0x1fff.

PMT PID

Indicates the PID that carries this program's PMT. This field's interpretation depends on the program number.

When the program number is '0', this parameter indicates the network PID, thereby giving the PID of the transport stream packets containing the Network Information Table. The presence of the network PID and the NIT is optional.

When the program number is non-zero, this parameter indicates the PID of transport stream packets containing the Program Map Table.

PMT Version

Indicates the version number of this program's Program Map Table. This number changes whenever the PMT is updated.

VC

Indicates the number of the VC on which this program is located.

11.18.5 Status > TS Multiplexers > Program > Elementary Stream Tab

Elementary Stream PID

Indicates the elementary stream PID.

Elementary Stream Type

Indicates the elementary stream type.

Chapter 12: NetVX ATM Modules

Configuration and Status Dialogs

12

12.1 Overview of NetVX ATM Interfaces

Each ATM module is equipped with both an optical and an electrical interface.

12.1.1 About NetVX ATM Interfaces

- The optical interface is permanently assigned as 'Interface 1' and carries SONET/SDH data.
- The electrical interface is permanently assigned as 'Interface 2' and carries PDH data (DS3/E3).
- To create connections, you must create a Virtual Channel (VC) on either interface. Such a VC is known as an ATM VC.
- Thereafter, use Cross Connections to link signals between and amongst ATM VCs and VCs on other NetVX modules. Use the links in the 'Related Procedures' section below for more details.

12.1.2 ATM Interface Configuration Parameters

The following configuration parameters control the NetVX's ATM interfaces.

- Tag – You can name each ATM interface with a string of up to 31-characters in length.
- Mode – Controls whether the interface operates bidirectionally, or only transmits.
- Loopback – Controls whether data are looped back to their source or not.
- Standard – Specifies the ATM networking standard for the selected interface.
- Transmit Rate – Specify the maximum rate of data transmission governing this interface. See the topic "Overview of NetVX ATM Interface Rates" on page 382 for a table of the maximum rates available according to each interface and standard.
- Clock – Specifies the clock source that the NetVX should use with this interface.
- Line Build Out – Applicable only to the PDH interface. Conditions the signal for the appropriate cable length.

The help topic for each interface's configuration dialog provides more details.

- "Config > ATM Properties SONET/SDH Dialog" on page 384.
- "Config > ATM Properties PDH Dialog" on page 387.

Related Procedures

- "How to Create an ATM Virtual Channel" on page 136.
- "How to Create a 'Copy' ATM Virtual Channel" on page 138
- "How to Create an IP Virtual Channel" on page 139.
- "How to Modify a Virtual Channel" on page 143.
- "How to Delete a Virtual Channel" on page 144.
- "How to Route ATM Traffic According to VPI" on page 145.

12.2 Overview of NetVX ATM Interface Rates

The following table indicates the maximum ATM rate for each interface based upon its Standard setting.

- The SONET and SDH 'Standard' settings in row 1 are applicable only to interface 1.
- The DS3 and E3 'Standard' settings are applicable only to interface 2, the PDH interface.

The Notes column explains how the maximum bandwidth figure is calculated for each interface.

Table 12-1 Maximum Rates per ATM Interface Type and Standard

'Standard' Settings	Maximum 'ATM Rate' (Mbps)	Notes
SDH, SONET	149.760	The raw OC-3 interface carries 155.520 Mbps. SONET and SDH use 270-byte lines carrying 260 bytes of payload. 149.760 = 155.520 * 260 / 270
DS3-cbit-adm	44.209694	The raw DS3 interface carries 44.736 Mbps. C-bit ATM-Direct-Map carries 680-bit frames with 672 payload bits/ frame. 44.209694 = 44.736 * 672 / 680
DS3-cbit-plcp	40.704	The raw DS3 interface carries 44.736 Mbps. C-bit PLCP carries 8000 frames per second, each with 12 ATM cells. 40.704 = 8000 * 12 * 53 * 8
ds3-m23-adm	44.209694	The raw DS3 interface carries 44.736 Mbps. M23 ATM-Direct-Map carries 680-bit frames with 672 payload bits/frame. 44.209694 = 44.736 * 672 / 680
ds3-m23-plcp	40.704	The raw DS3 interface carries 44.736 Mbps. M23 PLCP carries 8000 frames per second, each with 12 ATM cells. 40.704 = 8000 * 12 * 53 * 8
e3-751-adm	33.792	G.751 ATM-Direct-Map carries four 8.448 Mbps tributaries. 33.792 = 4 * 8.448
e3-752-plcp	30.528	G.751 PLCP carries 8000 frames per second; each frame has 9 ATM cells. 30.528 Mbps = 8000 * 9 * 53 * 8
e3-832-adm	33.920	G.852 ATM-Direct-Map carries 8000 frames per second, each with 10 ATM cells. 33.920 = 8000 * 10 * 53 * 8
SDH, SONET	149.760	The raw OC-3 interface carries 155.520 Mbps. SONET and SDH use 270-byte lines carrying 260 bytes of payload. 149.760 = 155.520 * 260 / 270

12.3 ATM Configuration

12.3.1 Config > ATM Interfaces Table

Abstract: *The 'ATM Interfaces' branch of the configuration tree provides a sub-branch for each ATM interface in the system. Sub-branches below each interface represent ATM VCs.*

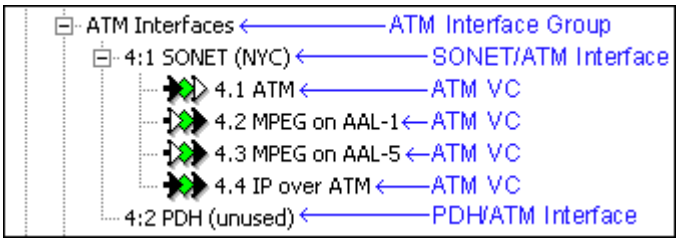


Figure 12-1 ATM Interfaces Branch of the Navigation Tree

The table on the right provides the following information about each ATM interface.

Note: For details about the colored icons shown in the navigation tree above, see the topic "Overview of Navigation Tree Icons" on page 180.

Mode

This field indicates the mode of operation each ATM interface is configured to operate in.

Standard

This field indicates the standard setting for each ATM interface.

ATM Tx Rate (Mbps)

Each column indicates the outgoing ATM cell bandwidth for the entire ATM interface.

Active Virtual Channels

This row lists the total number of active virtual channels on each ATM interface.

Active ATM Bandwidth

This row displays how much ATM bandwidth each ATM interface is using. The values in this row are the sums of the ATM Tx Rate for all active VC's on each ATM interface.

Available ATM Bandwidth

This row indicates how much bandwidth is available for use on each ATM interface.
Details: The values in this row are the ATM Tx rate less the Active ATM Bandwidth rate for each ATM interface.

12.3.2 Config > ATM Interfaces > Interface Tab

This table lists all ATM interface settings for the selected interface. Double click any cell to jump to a dialog and to configure underlying settings.

12.3.3 Config > ATM Interfaces > Virtual Channel Tab

This table lists all current ATM virtual channel settings for the selected module. Double click any cell to jump to the related underlying settings dialog.

Note: The column labeled 'MPEG AAL-5 PDU Size' is applicable only to 'MPEG' functions.

12.4 ATM Configuration Dialogs

12.4.1 Config > ATM Properties SONET/SDH Dialog

Interface Properties

Tag

Use this field to name this ATM physical interface. The tag may be up to 31 characters long.

Mode

Use this field to configure the mode of operation for this ATM interface.

Note: Availability of the 'bidirectional' option is governed by feature keying. See "ATM-M11 ATM-S11 and ATM-L11 Module Types and Features" on page 474 for details.

Bidirectional The interface sends and receives data.

Tx-Only The interface only transmits data. Use this setting if you know that you only want this ATM module to transmit data. This mode of operation suppresses Network Degrade and Network Fault alarm notifications from the receive interface.

Note: The controls for the network degrade and network fault alarms at the bottom of this dialog appear checked even when the 'Tx-Only' option is selected.

OFF Marks the interface as non-operational. Virtual channels may be associated with the interface, but those channels will carry no traffic.

Loopback

Use this control to set the loopback behavior for this interface.

OFF The ATM module performs transmit and receive operation.

External Data originating on the network and entering on the receive interface are returned (looped back) to the network via the transmit interface. No data are accepted for routing and the clock source is ignored.

Internal Data originating on the system and destined for the transmit interface are returned (looped back) to the system via the receive interface. No data are received by external equipment for routing and the clock source is ignored.

ATM Transmit Rate (Mbps)

This field's default setting displays the maximum output bit rate for this physical interface given the selected Standard (above). This rate may be reduced from the maximum for the selected standard as desired.

Enable Network Degrade Alarms

Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms

Use this control to enable Network Fault alarm notification. See "Network Fault Alarms" on page 495 for more information.

Enable Protection on Network Fault

Check this control if the ATM module has a backup configured and you would like the system to fail the module over to the backup in the event a service fault it received on the main module. See "General Module Redundancy Procedures" on page 431 for detailed description.

Note: This box must be checked on the ATM module on each side of the network connection in order to failover to work properly.

SONET/SDH Properties

Standard

Use this control to select an ATM standard for the SONET physical interface.

SONET Specifies use of SONET framing on the optical interface; interface 1.

SDH Specifies use of SDH framing on the optical interface; interface 1.

Clock

Use this control to identify the interface's clock source.

Note: The 'Clock' setting is ignored when the interface is configured to operate in loopback mode.

Internal The module uses its own internal clock.

Loop The module uses the clock from the incoming signal.

BITS Standard

Specifies the BITS clock standard. An interface that puts its interface line clock in BITS mode uses this value to know what BITS clock type to receive, and it retransmits the same type. When an interface runs with its line clock in 'loop' or 'internal' mode, this value indicates which BITS clock signal to transmit.

T1 Specifies a T1-compatible clock.

E1 Specifies an E1-compatible clock.

BITS Line Buildout

Specifies the BITS line buildout configuration. The values of this parameter let the module adjust the BITS transmit signal strength and receive sensitivity to the appropriate level.

In Configuring the buildout in uses a lower signal level.

Out Configuring the buildout out uses a higher signal level.

Tx Path Trace Identification

Use this command to specify the string that this interface shall send as an ATM path trace. Path trace is a means of verifying that interfaces are properly connected. The usual contents of a path trace message are the identification of the transmitter, similar to the configuration tag.

<null> The null (empty) string disables rxpathtrace.

<15-char> Use a 15-character string for SDH networks.

<62-char> Use a 62-character string for SONET networks.

Rx Path Trace Identification Expected

Use this command to specify the string that this interface expects to receive as the result of a successful ATM path trace.

When this parameter is set to a non-null value, its setting is compared to the status value of stat slot.s/atm/ifc.1/ss rxPathTraceRcv. In the event these values are not identical, the Network Degrade - Errors in Input Signal alarm is raised, the stat slot.s/atm/ifc.m rxerrsec errored-seconds counter increments, and the 'Interface' LED turns 'amber'.

<null> The null (empty) string disables rxpathtrace.

<15-char> Use a 15-character string for SDH networks.

<62-char> Use a 62-character string for SONET networks.

12.4.2 Config > ATM Properties PDH Dialog

Interface Properties

Tag

Use this field to name this ATM physical interface. The tag may be up to 31 characters long.

Mode

Use this control to set the mode of operation for this ATM interface.

Note: Availability of the 'Bidirectional' option is governed by feature keying. See "ATM-M11 ATM-S11 and ATM-L11 Module Types and Features" on page 474 for details.

Bidirectional The interface sends and receives data.

Tx-Only The interface only transmits data. Use this setting if you know that you only want this ATM module to transmit data. This mode of operation suppresses Network Degrade and Network Fault alarm notifications from the receive interface.

Note: The controls for the network degrade and network fault alarms at the bottom of this dialog appear checked even when the 'Tx-Only' option is selected.

OFF Marks the interface as non-operational. Virtual channels may be associated with the interface, but those channels will carry no traffic.

Loopback

Use this control to set the loopback behavior for this interface.

OFF The ATM module performs transmit and receive operation.

External Data originating on the network and entering on the receive interface are returned (looped back) to the network via the transmit interface. No data are accepted for routing and the clock source is ignored.

Internal Data originating on the system and destined for the transmit interface are returned (looped back) to the system via the receive interface. No data are received by external equipment for routing and the clock source is ignored.

Enable Network Degrade Alarms

Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms

Use this control to enable Network Fault alarm notification. See "Network Fault Alarms" on page 495 for more information.

PDH Properties

Standard

Use this control to select an ATM standard for the PDH physical interface.

ds3-cbit-adm Specifies use of DS3 with CBIT parity direct mapped onto ATM.

ds3-cbit-plcp Specifies use of DS3 with CBIT parity and PLCP framing.

ds3-m23-adm (default) Specifies use of DS3 format with M23 emulation direct mapped onto ATM.

ds3-m23-plcp Specifies use of DS3 with M23 emulation and PLCP framing.

e3-751-adm Specifies use of E3 using G.751direct mapped onto ATM.

e3-751-plcp Specifies use of E3 using G.751 and PLCP framing.

e3-832-adm Specifies use of E3 using G.832 direct mapped onto ATM.

ATM Transmit Rate (Mbps)

This field's default setting displays the maximum output bit rate for this physical interface given the selected Standard (above). This rate may be reduced from the maximum for the selected standard as desired.

Clock

Use this control to identify the interface's clock source.

Note: The 'Clock' setting is ignored when the interface is configured to operate in loopback mode.

Internal	The module uses its own internal clock.
Loop	The module uses the clock from the incoming signal.

Insert DS3 Line Build Out

This field configures the DS3 line build out (attenuation) setting.

Checked	Use his setting when the DS3 cable is less than 225 feet.
Unchecked	Use this setting when the DS3 cable is longer than 225 feet.

12.4.3 Config > ATM Interface > Router Dialog

Abstract: *Use the controls in this dialog configure router-related settings.*

Receive Interface Router

Use these controls to configure router settings to support ATM module input redundancy. See "Receive Interface Router Settings" on page 450.

Transmit Interface Router

Use these controls to configure router settings to support ATM module output redundancy. See "Transmit Interface Router Settings" on page 458 topic for details.

12.5 Config > ATM Interface > VC Control Branch

12.5.1 Config > ATM Interface > VC Control Dialog

Entries

Lists all virtual channels (VCs) configured on this interface. Highlight any VC in the list of entries to see its current settings.

Control

Tag

Use this field to enter a descriptive tag uniquely distinguishing this virtual channel. The tag may be up to 31 characters long.

Function

Use this control to set the AAL formatting function.

Note: Availability of the 'MPEG on AAL-1, CE', and 'MPEG on AAL-5' options is governed by feature keying. See "ATM-M11 ATM-S11 and ATM-L11 Module Types and Features" on page 474 for details.

MPEG on AAL-1, CE Use this function when This function means the VC carries MPEG transport stream using circuit emulation AAL-1 encapsulation (without forward error correction).

MPEG on AAL-1, J.82 Use this function with a VC carrying MPEG transport stream using AAL-1 encapsulation with forward error correction. See Notes 2 & 3 below.
ATM_cell_rate = output_rate * 128/124 * 53/47

MPEG on AAL-5 Use this function with a VC carrying MPEG transport stream using AAL-5 encapsulation. The ATM cell rate depends on the MPEG AAL-5 size setting. See Note 2 below.

IP over ATM Use this function with a VC carrying IP on ATM (IPOA) traffic.

VC as a Destination – When operating as a cross connection destination, the VC receives IP packets from the backplane and encapsulates them in ATM cells for transmission on the network interface.
VC as a Source – When operating as a cross connection source, the VC collects incoming ATM cells from the interface, strips off the ATM headers, builds IP packets, and puts those IP packets on the backplane.

ATM This function means the VC carries ATM cells without extracting user payload.

ATM Virtual Path Use this function with a VC to route ATM cells according to VPI. Any VC operating in this mode accepts only those cells received through the ATM interface that share its VPI value. For cells transmitted through the ATM interface, the configured VPI value is inserted into all the ATM cell headers, while the cells' existing VCI values are preserved.

LAN LLC his channel will carry LAN traffic with LLC encapsulation. When the VC is a destination of a cross-connect entry, it receives LAN frames from the backplane and encapsulates them by prefixing the LAN PDU with an IEEE 802.2 Logical Link Control (LLC) header and then encapsulating them in ATM cells for transmission on the network interface. RFC 1483 describes this as the "LLC Encapsulation" method for carrying LAN traffic over ATM AAL5.

VC as a Source – It collects incoming ATM cells from the interface, strips the ATM and LLC headers, builds LAN frames, and puts those frames on the backplane. When used in a cross-connect entry, a channel with this function should be paired with another LAN channel.

VC as a Destination – When operating as a cross connection destination, the VC receives LAN frames from the backplane and encapsulates them by prefixing the LAN PDU with an IEEE 802.2 Logical Link Control (LLC) header and then encapsulating them in ATM cells for transmission on the network interface. RFC 1483 describes this as the 'LLC Encapsulation' method for carrying LAN traffic over ATM AAL5.

LAN VC This channel will carry LAN traffic without LLC encapsulation. When the VC is a destination of a cross-connect entry, it receives LAN frames from the backplane and encapsulates them in ATM cells for transmission on the network interface. RFC 1483 describes this as the "VC Based Multiplexing" method for carrying LAN traffic over ATM AAL5. When the VC is a source, it collects incoming ATM cells from the interface, strips the ATM headers, builds LAN frames, and puts those frames on the backplane. When used in a cross-connect entry, a channel with this function should be paired with another LAN channel.

VC as a Destination – When operating as a cross connection destination, the VC receives LAN frames from the backplane and encapsulates them in ATM cells for transmission on the network interface. RFC 1483 describes this as the 'VC Based Multiplexing' method for carrying LAN traffic over ATM AAL5.

VC as a Source – When operating as a cross connection source, the VC collects incoming ATM cells from the interface, strips the ATM headers, builds LAN frames, and puts those frames on the backplane. When used in a cross-connect entry, a channel with this function should be paired with another LAN channel.

Note: (1) * Availability of this selection is determined by the module's feature profile. See "ATM-M11 ATM-S11 and ATM-L11 Module Types and Features" on page 474. See also Util Key'.
(2) Each ATM-M11, ATM-S11 module supports up to 63 MPEG-AAL1/AAL5 VCs.
(3) In releases prior to 6.1.0 the option 'mpeg-aal1-j82' was known as 'mpeg-aal1'

(4) In releases prior to 6.1.0 the option ‘lan-vc’ was known as ‘lan’.

Enable Fault Alarms

Check this box to enable the NetVX to notify of signal fault alarm events for this virtual channel.

Enable Degrade Alarms

Check this box to enable the NetVX to notify signal degrade alarm events for this virtual channel.

See "Overview of NetVX Alarms" on page 214 for details.

Routing

Connection (radio button)

Choose this option to create a standard ATM VC. This type of VC requires VPI and VCI configuration settings to identify the circuit on an ATM network.

Copy From VC (radio button)

Choose this option if you want to create a ‘copy’ of an ATM VC originating on this module. The copy may operate as a cross connection source. Most of the VCs parameters are inherited from the original VC. See the procedure "How to Create a ‘Copy’ ATM Virtual Channel" on page 138 for details.

VPI, VCI

Use these controls to specify the Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI) for this VC.

New

Press this button to activate a new VC.

Delete

Highlight a VC and press this button to delete it.

12.5.2 Config > ATM Interface > VC Control > VC Processing Dialog

Entries

Lists all virtual channels (VCs) configured on this interface. Highlight any VC in the list of entries to see its current settings.

ATM

Transmit Priority

Specifies the output priority for ATM traffic shaping. An ATM interface has three output queues, one each for high, medium, and low priority traffic. When an interface is ready to transmit a cell, it scans the queues from high to low priority, looking for a ready cell. Higher priority cells always preempt lower priority data. If no cells are in any of the three queues, the interface sends an idle cell.

High — High priority data have the lowest latency. Typically, MPEG streams would use high priority, minimizing latency and improving jitter behavior.

Medium — Medium priority payload should be able to tolerate some network jitter. The interface itself will have enough bandwidth to carry the data, but the outgoing cells may not get their preferred time slots, thus causing more cell delay variation than high-priority traffic. Typically, ATM payload (non-MPEG) would use medium priority.

Low — The interface uses low priority data to fill the 'gaps' in the outgoing bit stream. This value is appropriate for opportunistic data with little or no latency requirements. Typically, IP traffic would use low priority on video networks.

Logical IP Subnet

Logical IP Subnet (LIS) association is only possible when the VC's 'Function' (above) is set to 'IPOA'. This control lists all Logical IP Subnets this system can access. Select the LIS to associate with this VC.

MPEG-2

Processing

Use this control to specify whether or not the system should pad the MPEG-2 transport stream with null packets. This value applies only when the virtual channel's payload type carries MPEG.

Constant Bit Rate — (Constant Bit Rate) Incoming packets receive timestamps with modified clock values in order to make them appear as if they had arrived at a fixed interval.

Outgoing packets are read from their buffer at a constant rate. Null transport stream packets are inserted to adjust the output rate of the multiplex to the required output value.

* Packets in 'Constant Bit Rate' streams do have adjusted PCRs.*

NOTE: The PCRs in CBR output packets are adjusted as follows:

adjusted_PCR = original_PCR + (system_clock – timestamp)

Passthrough — Incoming packets receive timestamps with modified clock values to make them appear as if they had arrived at fixed intervals.

Outgoing packets are read from their buffers at the highest rate possible without exceeding the configured Output Rate. No null packets are inserted.

* Packets in 'Passthrough' streams do not have adjusted PCRs.*

Variable Bit Rate — Incoming packets receive timestamps with the system's clock values. No adjustment is made to simulate a regular arrival interval between packets.

Outgoing packets are read from their buffers at the highest rate possible without exceeding the configured Output Rate. No null packets are inserted.

* Packets in 'Variable Bit Rate' streams do not have adjusted PCRs.*

AAL-5 PDU Size

Specifies the number of transport stream packets in each AAL-5 Protocol Data Unit (PDU).

2	Typical setting used for most MPEG-2 applications.
14	Use this setting with server ATM I/O cards that have a 16-bit PDU size limit.
38	Use this setting when encoding material for server-based storage and retrieval.

12.5.3 Config > ATM Interface > VC Control > VC Rates Dialog

Entries

Lists all virtual channels (VCs) configured on this interface. Highlight any VC in the list of entries to see its current rate settings.

Input Policing

ATM Rx Rate (Mbps)

Set this VC's maximum *gross* input rate. Data is dropped if input exceeds this rate. This rate should match the rate allocated to the selected VC on the ATM network. The rate '0' disables input policing.

Note: For LAN applications, be sure to read the note on "Rx Policing Rate (Mbps)" on page 411.

Payload Rx Rate (Mbps)

This field indicates the calculated rate of ATM payload as a function of the ATM Rx Rate (above) and settings in the 'VC Processing' dialog.

Output

Payload Tx Rate (Mbps)

Use this control to set the outgoing payload rate. Example: Set the rate to 6 Mbps to transmit a 6 Mbps transport stream over this virtual channel.

Note: The 'payload rate' simply identifies the bit rate of the material entering the ATM through this VC. The 'ATM Tx Rate' takes into account both the payload rate and ATM overhead. ATM overhead is the additional bandwidth required to frame the payload and carry it properly through the ATM network.

ATM Tx Rate (Mbps)

This read-only entry indicates the calculated total ATM rate as a function of the Payload Tx Rate (above) and control settings in the VC Processing dialog.

Interface (Slot).(Interface #) (Tag)

Full ATM Rate (Mbps)

This read-only entry indicates the maximum ATM rate for the indicated interface.

Note: The rate is different for each interface and is based on the selected ATM standard and ATM rate configured in the VC Processing dialog.

Avail. ATM Rate (Mbps)

This read-only entry indicates the amount of bandwidth available on the specified interface. The formula for this calculation is as follows.

Available ATM Rate = Full ATM Rate - (total of all VC rates)

12.6 ATM Status

Abstract: *This section describes ATM status dialogs. Most of the counts described in this section increase to 2^32 - 1, or 4294967295 at which point they wrap back around to zero.*

12.6.1 Status > ATM Interfaces Summary Table

This table provides a status summary of all ATM interfaces configured in this system. This view is updated in real time at the user-specified status polling interval.

Composite LOS

Indicates fault in the event or a loss of receive signal.

Near End Errored Seconds

Indicates the number of seconds during which LOS, LOF, AIS, AAL5, or LOP (SONET only) errors were received by all VCs on this interface.

Far End Errored Seconds

Indicates the number of seconds during which coding violations such as FEBEs and RDI were returned to all VCs on this interface.

ATM Rx Rate (Mbps)

This field indicates the current ATM receive rate on this interface.

ATM Tx Rate (Mbps)

This field indicates the current ATM transmit rate on this interface

ATM Layer Statistics

Received Cells

Maintains a count of cells received since the ATM module was last reset.

Transmitted Cells

This field displays a count of the cells transmitted since the ATM module was last reset.

Loss of Cell Delineation

Fault indicates a loss of cell delineation.

Correctable HEC Errors

This field displays a count of the number of ATM cells with correctable HEC errors received.

Uncorrectable HEC Errors

This field displays a count of the number of ATM cells with uncorrectable HEC errors received.

ATM Rx Un-routed Cells

This field displays a count of the number of cells received with ATM protocol errors.

LEDs

Fault

Indicates the state of the ATM module's fault LED. See "ATM Module Faceplates" on page 193 for details.

Input

Indicates the state of the ATM module's input LED ATM module's fault LED. See "LED States" on page 193 for details.

12.6.2 Status > ATM Interfaces > SONET/SDH Interface Tab

Note: Counts on this page increase to 2^32 (4294967295) and then wrap back to zero

Composite AIS

Indicates composite Alarm Indication Signal (AIS) received for this interface. The physical interface's current operating standard (See Section 12 "NetVX ATM Modules" on page 383) controls which of the following conditions affect the state of this parameter.

- See the "Line AIS (DS3)" control on page 399
- See the "Line AIS (E3)" control on page 399
- See the "Line AIS (SS)" control on page 397
- See the "Path AIS (SS)" control on page 397

When this fault is active it triggers the 'Network Fault - Loss of Input Signal' alarm.

Composite LOS

Indicates fault in the event or a loss of receive signal.

Composite RDI

Indicates composite Remote Defect Indicator (RDI) received for this interface. The physical interface's current operating standard (See Section 12 "NetVX ATM Modules" on page 383) controls which of the following conditions affect the state of this parameter.

- See the "Receive Line RAI (DS3)" control on page 399
- See the "Receive Line RAI (E3)" control on page 399
- See the "Receive Line RDI (E3)" control on page 399
- See the "Line RDI (SS)" control on page 397
- See the "Path RDI Errors (SS)" control on page 397

When this fault is active it triggers the 'Network Degrade - Errors in Input Signal' alarm.

Near End Errored Seconds

Indicates the number of seconds during which LOS, LOF, AIS, AAL5, or LOP (SONET only) errors were received on this interface.

Far End Errored Seconds

Indicates the number of seconds during which coding violations such as FEBEs and RDI were returned to this interface.

ATM Rx Rate (Mbps)

Indicates the bit rate at which this interface is receiving data.

ATM Tx Rate (Mbps)

Indicates the bit rate at which this interface is transmitting data.

ATM Layer

Received Cells

Maintains a count of cells received since the ATM module was last reset.

Transmitted Cells

Maintains a count of cells transmitted since the ATM module was last reset.

Loss of Cell Delineation

Fault indicates a loss of cell delineation.

Correctable HEC Errors
Maintains a count of ATM of the number of cells with correctable HEC errors received.

Uncorrectable HEC Errors
Maintains a count of ATM of the number of cells with uncorrectable HEC errors received.

ATM Rx Protocol Errors
Indicates the numbers of cells received with ATM protocol errors.

SONET/SDH

Line AIS (SS)
Fault indicates an upstream piece of equipment sent a Line Alarm Indication Signal (AIS).

Line BIP-8 Errors
Maintains a count of line-layer BIP-8 errors.

Line FEBE Errors
Maintains a count of line-layer Far End Block Errors (FEBE).

Line RDI (SS)
Present indicates a piece of equipment receiving this signal sent a line-layer Remote Defect Indicator (RDI).

Loss of Frame
Fault indicates a SONET framing error.

Loss of Pointer
Fault indicates a loss of pointer error.

Loss of Signal
Indicate a loss of input signal.

Path AIS (SS)
Fault indicates an upstream piece of equipment sent a Path Alarm Indication Signal (AIS).

Path BIP-8 Errors
Maintains a count of Bit Interleaved Parity-8 (BIP) errors.

Path FEBE Errors
Maintains a count of path-layer Far End Block Errors (FEBE).

Path RDI Errors (SS)
Present indicates a piece of equipment receiving this signal sent a path-layer Remote Defect Indicator (RDI).

Section BIP-8 Errors
Maintains a count of section Bit Interleaved Parity-8 (BIP) errors.

12.6.3 Status > ATM Interfaces > PDH Interface Tab

Note: Counts on this page increase to 2^32 - 1 (4294967295). After reaching this value, counts wrap back around to zero

Shortcuts to sub topics within this topic:

- "ATM Layer Status" on page 398
- "DS3 Status" on page 398
- "E3 Status" on page 399
- "PLCP Status" on page 399

Composite LOS
Indicates fault in the event or a loss of receive signal.

Near End Errored Seconds
Indicates the number of seconds during which this interface experienced LOS, LOF, AIS, AAL5, or LOP (SONET only) errors.

Far End Errored Seconds
Indicates the number of seconds during which coding violations such as FEBEs and RDI were returned to this interface.

ATM Layer Status

Received Cells
Maintains a count of cells received since the ATM module was last reset.

Transmitted Cells
Maintains a count of cells transmitted since the ATM module was last reset.

Loss of Cell Delineation
Fault indicates a loss of cell delineation.

Correctable HEC Errors
Maintains a count of ATM of the number of cells with correctable HEC errors received.

Uncorrectable HEC Errors
Maintains a count of ATM of the number of cells with uncorrectable HEC errors received.

ATM Rx Protocol Errors
Indicates the numbers of cells received with ATM protocol errors.

DS3 Status

Bi-Polar Violations
Maintains a count of bi-polar violations.

C-Bit Coding Violations
Maintains a count of C-Bit coding violations.

Excessive Zero Violations
Maintains a count of excessive zero violations.

Line AIS (DS3)
Fault indicates an upstream piece of equipment sent a Line Alarm Indication Signal (AIS).

Receive Line RAI (DS3)
Present indicates the receiving device on this line returned a Remote Alarm Indication (RAI).

Loss of Frame
Fault indicates this interface is experiencing a loss of frame.

Loss of Signal
Fault indicates this interface is experiencing a loss of signal.

Receive Path FEBE
Maintains a count of path-layer Far End Block Errors (FEBE) received.

P-bit Coding Violations
Maintains a count of P-bit Coding Violations received.

E3 Status

Line Coding Violations
Fault indicates Line Coding Violations received.

Line AIS (E3)
Fault indicates an upstream piece of equipment sent a Line Alarm Indication Signal (AIS).

Line BIP-8 Errors
Maintains a count of path-line BIP-8 errors.

Receive Line RAI (E3)
Present indicates the receiving device on this line returned a Remote Alarm Indication (RAI).

Receive Line RDI (E3)
Present indicates a piece of equipment receiving this signal sent a line-layer Remote Defect Indicator (RDI).

Line REI Count
Maintains a count of Remote Error Indications (REI) received.

Loss of Frame
Fault indicates an E3 framing error.

Loss of Signal
Fault indicates this interface is experiencing a loss of signal.

PLCP Status

Loss of Frame
Indicates a loss of PLCP framing.

Path BIP-8 Errors
Maintains a count of path-layer BIP-8 errors.

Path FEBE Errors

Maintains a count of path-layer Far End Block Errors (FEBE).

Receive Path RAI

Present indicates the receiving device in this connection path returned a Remote Alarm Indication (RAI).

12.6.4 Status > ATM Interfaces > Virtual Channel Tab

This table provides statistics about all VCs on the selected interface.

VPI

Indicates the VPI that this virtual channel is configured to use.

VCI

Indicates the VCI that this virtual channel is configured to use.

ATM Rx Rate

Indicates the bit rate at which this interface is receiving data.

ATM Tx Rate

Indicates the calculated total ATM rate as a function of the Payload Transmit rate of the selected VC.

Payload Rx Rate

Indicates the receive payload bit rate on this VC (see note below).

Payload Tx Rate

Indicates the transmit payload bit rate on this VC (see note below).

Note: The conversion from ATM cell rate to payload rate depends on the 'Function' that the VC is configured to operate. See the description of the 'Function' setting in the "Config > ATM Interface > VC Control > VC Processing Dialog" on page 392.

ATM	The value indicates the payload of all ATM cells for the channel, disregarding the 5-byte ATM cell headers.
IPOA	The value indicates the IP packet data rate, including IP and LLC/SNAP headers, and excluding the ATM cell headers and AAL-5 overhead.
mpeg-aal1, mpeg-aal5	The value indicates the transport stream rate, before null packet insertion. The 5-byte ATM header and the ATM Adaptation Layer bytes are excluded.

Errors

VC AIS (Available in a future release).

Fault indicates an Alarm Indication Signal (AIS) detected on this VC.

VC Continuity (Available in a future release).

Fault indicates one or more continuity count errors detected on this VC.

VC RDI (Available in a future release).

Fault indicates a remote defect indicator (RDI) detected on this VC.

AAL-5 CRC Errors

Maintains a count of AAL-5 CRC errors received.

AAL-5 Rx Protocol Errors

Maintains a count of AAL-5 protocol errors received.

Tx Buffer Overflow Seconds

Maintains a count of the number of consecutive seconds that this VC experienced transmit buffer overflow.

Traffic

Corrected FEC Blocks

Maintains a count of corrected Forward Error Correction (FEC) blocks.

Uncorrected FEC Blocks

Maintains a count of FEC blocks that system was not able to correct. An increasing count typically indicates poor network conditions.

Sequence Errors

Indicates the count of AAL-1 sequence errors on this VC. AAL-1 uses a 3-bit sequence number to monitor cell order. This counter increments when a cell arrives with an incorrect sequence number. An incrementing sequence error counter does not necessarily imply a loss of data because of AAL-1's ability to correct errors.

Received Cells

Maintains a count of cells received.

Discarded Cells

Maintains a count of discarded cells.

Received PDUs

Maintains a count of PDU received on this VC.

Transmitted Cells

Maintains a count of cells transmitted over this VC.

Transmitted PDUs

Maintains a count of PDUs. transmitted over this VC.

Chapter 13: NetVX IP Module

Procedures, Configuration, and Status Dialogs

13

13.1 IP Module Configuration

13.1.1 Config > IP Modules Table

Abstract: *The 'IP Modules' branch of the navigation tree contains a branch for each module that has an external IP interface. These modules include system controllers and gigabit ethernet modules.*

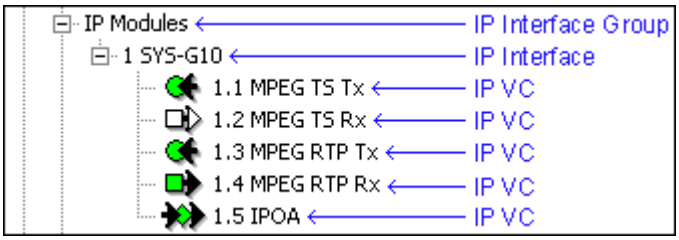


Figure 13-1 IP Modules Branch of the Navigation Tree

The table in the right displays the tag and the IP address settings of each IP module in the system.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

Note: For details about the colored icons shown in the navigation tree above, see the topic "Overview of Navigation Tree Icons" on page 180.

13.2 IP Module Branch

13.2.1 Config > IP Modules > Interface Tab

Abstract: *This level of the navigation tree represents a specific IP-capable module.*

The table on this tab summarizes settings on the selected IP module.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

13.2.2 Config > IP Modules > IP Routing Table Tab

Abstract: *This table displays the list of static routes entered by users. Route 1 is the default route.*

The complete routing table, which may also include routes entered by the operating system, is displayed under in the "Status > IP Modules > IP Routing Table Tab" on page 425‘.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

13.2.3 Config > IP Modules > Virtual Channel Tab

Abstract: *Each branch at this level of the navigation tree represents an IP VC. Use an IP VC on one end of a cross connection to exchange IP traffic between the VC’s respective physical interface and other modules.*

The table at the right provides a summary of IP module VC settings.

In the Vidiem™ screen, double-click in the white area of any row in the table on the right side of the screen to open the underlying configuration dialog.

13.2.4 Config > IP Modules > Auxiliary Tab

Abstract: *This table lists the ‘Multicast Source’ addresses associated with each ‘VC’.*

13.2.5 Config > IP Modules > VLAN Tab

This table lists VLAN information associated with each ‘VC’.

13.2.6 Config > IP Modules > DHCP Tab

Abstract: *This table lists tags, IP addresses, and subnet masks of all DHCP servers accessible by this system. Up to ten DHCP servers may be specified by using a different index number for each.*

13.2.7 Config > IP Modules > M/H Services Tab

Abstract: *This table lists details of each M/H service handled by this system controller module.*

Related Topics

- Section 3.13.1, "How to Configure Mobile/Handheld (M/H) on an ATSC Broadcast Configuration" on page 132
- Section 11.7.3, "Config > TS Transmitter > VC Control > M/H Ensemble Dialog" on page 341
- Section 13.3.3, "Config > IP Modules > M/H Services" on page 408

13.3 IP Module Configuration Dialogs

13.3.1 Config > IP Modules > Slot#.Interface Dialog

Abstract: *Use the controls in this dialog to configure the IP interface.*

Note: IMPORTANT!
(1) This dialog can only change the GBE-C11's IP-related parameters. System Controller IP parameters are read-only. See "How to Set the NetVX IP Address" on page 38 for instructions on changing the system controller's IP parameters.
(2) The GBE-C11's IP parameters are updated whenever a 'write' is made to the system using the 'Device > Write' menubar combination.

Interface Properties

Tag

Use this field to name this IP interface. The tag may be up to 31 characters long.

Ethernet Link

Specifies the link handling for this interface.

Automatic	Automatically negotiates an appropriate link value. For the GBE-C11 module, this value initially selects between the electrical and optical interface, depending on which is physically present and has link connectivity.
Electrical	Automatically negotiates an appropriate link value. For the GBE-C11 module, this also specifically selects the electrical interface and bypasses the optical component.
10 BaseT	Specifies 10 BaseT, full duplex on the electrical interface.
100 BaseT	Specifies 100 BaseT, full duplex on the electrical interface.
1000 BaseT	Specifies 1000 BaseT, full duplex on the electrical interface.
optical	Automatically negotiates an appropriate link value. For the GBE-C11 module, this also specifically selects the optical interface and bypasses the electrical component.

Note: IMPORTANT! Care must be taken to ensure that the Ethernet ports on both the GBE-C11 and external piece of equipment are set to the same link setting; such as 'Auto', or '1000 Mbps', or '100 Mbps'.

IP Address

Use this field to set the IP address for this interface.

Note: See the description of the IP Mode parameters 'Trunk Full' and 'Trunk Minimal' for details on IP address assignments and the appropriate sub-netting that should be assigned for each mode.

IP Subnet Mask

Use this field to set the IP subnet mask for this interface.

Note: This field is read-only on system controllers.

Enable Network Degrade Alarms

Check this box to enable notification of any Network Degrade Alarms detected on this interface. See "Network Degrade Alarms" on page 493 for more information.

Enable Network Fault Alarms

Check this box to enable notification of any Network Fault Alarms Detected on this interface. See "Network Fault Alarms" on page 495 for details.

Enable Protection on Network Faults

Check this box to cause this module to failover to its backup in the event it experiences a Network Fault.

Enable DHCP

(Available in a future release) Check this box to enable Dynamic Host Configuration Protocol (DHCP) on this IP interface.

Enable RIP

Check this box to enable Routing Information Protocol (RIP) on this interface.

Any changes are made to this parameter must be updated in conjunction with other IP-related parameters using the 'IP Update Command'.

IP Video Gateway Address

Sets the IP address of the interface's video gateway. The GBE-C11 uses the gateway address, specified by this setting, to routing video onto other subnets.

LAN Behavior

Mode

Specifies the LAN mode of the GBE-C11 interface.

access-link Use this setting for 'LAN Extension' between NetVXs. LAN Extension turns the interface into a 'wire' in which all received and transmitted Ethernet frames are simply passed through an IP VC. This mode does not support video on IP, nor does it provide IP routing.

trunk-minimal Use this setting when using multiple GBE interfaces in one chassis and all must be on the same subnet.
This setting supports Video on IP (VIP), VLAN, ICMP, and IGMP.
This setting excludes control protocols, such as SNMP or telnet, and any IP routing.

trunk-full Use this setting when using multiple GBE interfaces in one chassis and each must be on separate subnets.
Use this setting for Video on IP (VIP), VLAN, ICMP, IGMP, SNMP, Telnet, and IP Routing. This setting supports 'normal' LAN traffic (untagged Ethernet frames), in-band control. This option also supports generic IP processing (routing, SNMP, etc.) on system controller modules. This is the default setting and it also represents the interface behavior prior to firmware release 6.5.

Table 13-1 GBE-C11 IP Interface Mode Attributes

Mode Setting	Application/Usage	VC Functions Supported	VLAN Tags	ICMP, IGMP Protocols	SNMP, Telnet Protocols	IP Routing
Access Link (GBE-C11-only)	LAN Extension	LAN LAN-TS	N/A	N/A	N/A	N/A
Trunk Minimal (GBE-C11-only)	Video on IP	All Functions	Enabled	Enabled	Disabled	Disabled
Trunk-Full (GBE-C11)	Video on IP, In-Band Control	All Functions	Enabled	Enabled	Enabled	Enabled
Trunk-Full (SYS-G10, SYS-A12, SYS-A22)	Video on IP, In-Band Control, Generic IP	All but 'LAN'	Disabled	Enabled	Enabled	Enabled

MPEG Time to Live

Specifies the time-to-live (TTL) value for IP packets carrying MPEG transport stream. Each node through which a packet passes, decrements the packet's time-to-live value. When the TTL value reaches zero (without reaching the desired destination), the packet is discarded. This setting is applicable to those IP VCs with a function set to one of the MPEG options.

1 to 255 Range of MPEG TTL values.

Tx ARP Time

Set to 0 if no ARP (address resolution protocol) requests should be sent. If set to less than 15, a default of 15 seconds is used..

0 to 300s Range of values.

13.3.2 Config > IP Modules > IP Routing Table Dialog

Abstract: *This dialog provides configuration access to IP routing table settings.*

IP Routing Table Properties

Entries
Provides an indexed list of IP routing table entries.

Tag
Use this control to name individual IP routing table entries.

Destination IP Address
Identifies a specific destination IP address.

Destination IP Subnet
Identifies the subnet mask for the specified destination IP address.

Next Hop IP Address
Identifies the next address for packets en route to the destination IP address.

New
Press this button to create a new IP Routing Table entry and enable access to the configuration controls listed above.

Delete
Highlight an entry and click this button to delete it.

13.3.3 Config > IP Modules > M/H Services

Service Name

Use this control to specify a 'Name' for this M/H service. The 'Name' specified is the string that will appear on mobile handsets.

Major Channel/Minor Channel

Use these fields to specify the M/H Major and Minor channel numbers for the selected H/H service. The numbers specified are those that end-user of the selected M/H service will tune to.

1-255 Range of values for the Major Channel number.

0 to 255 Range of values for the Minor Channel Number

Low Destination Port

Use this control to specify the starting (IP multicast) port number for contiguous series of services that shall make up this ensemble.

Language of Audio 1/Audio 2

Specifies the language descriptor for each Audio Channel (1 and 2).

Note: If the encoder in the same NetVX system as this module, then these controls may be ignored.

Multicast IP Address

Use this control to specify the IP multicast address on which this ensemble is located.

Note: The multi-cast IP address must be between 224.###.###.### and 239.###.###.###.

Ensemble ID

Use this control to select the 'Ensemble ID.'

Port Count

Use this control to specify how many IP multicast ports shall be used. Ports start with the 'Low Destination Port' value specified above, and increase +1 until the port count (inclusive of the first port) is reached. The ENC-A21 uses four ports: 1 for video, 1 for video control, 1 for audio, 1 for audio control.

New (button)

Enables the selected entry for writing.

Delete (Button)

Clears all fields associated with the selected entry.

Related Topics

- Section 3.13.1, "How to Configure Mobile/Handheld (M/H) on an ATSC Broadcast Configuration" on page 132
- Section 11.7.3, "Config > TS Transmitter > VC Control > M/H Ensemble Dialog" on page 341
- Section 13.2.7, "Config > IP Modules > M/H Services Tab" on page 404

13.4 Config > IP Modules > VLAN Dialog

Abstract: *Use this dialog to configure the VLAN.*

Entries

Provides a list of all configured IP virtual channel entries.

Tag

Use this control to name individual IP virtual channel entries.

VLAN ID

Lists the Virtual LAN Identifier (VLAN ID).

MPEG Time to Live

Specifies the time-to-live (TTL) value for IP packets carrying MPEG transport stream. Each node through which a packet passes, decrements the packet's time-to-live value. When the TTL value reaches zero (without reaching the desired destination), the packet is discarded. This setting is applicable to those IP VCs with a function set to one of the MPEG options.

1 to 255 Range of MPEG TTL values.

IP Address

Use this field to set the IP address for this interface.

Note: See the description of the IP Mode parameters 'Trunk Full' and 'Trunk Minimal' for details on IP address assignments and the appropriate sub-netting that should be assigned for each mode.

IP Subnet Mask

Use this field to set the IP subnet mask for this interface.

Note: This field is read-only on system controllers.

IP Video Gateway Address

Sets the IP address of the interface's video gateway. The GBE-C11 uses the gateway address, specified by this setting, to routing video onto other subnets.

13.5 Config > IP Modules > VC Control Branch

13.5.1 Config > IP Modules > VC Control Dialog

Abstract: *Use this dialog to configure IP VCs.*

Entries

Provides a list of all configured IP virtual channel entries.

Control

Tag

Use this control to name individual IP virtual channel entries.

Function

Use this control to specify the function of this IP VC. The exact behavior is dependent upon the interface mode selection (See Section 13 "NetVX IP Module" on page 406) and is described below.

LAN Use this setting for VCs carrying LAN traffic.

LAN w/ Interface Mode = 'Access Link' In this mode, only a single IP VC should exist on this interface. The interface and the VC behave like a wire with only one source and one destination.

LAN w/ Interface Mode = 'Trunk Minimal' or 'Trunk Full' In this mode VCs with function 'LAN' carry VLAN traffic. VLAN-tagged packets are handled at hardware speeds. Untagged packets match the interface's default LAN and receive the interface's configured routing. When used in a cross-connect entry, a VC with this function should be paired with another LAN VC.

LAN-TS Use this setting to connect two LANs via a transport stream connection. This mode creates a legal MPEG stream (with a PAT and a PMT) that encapsulates Ethernet frames within transport stream packets.

LAN-TS w/ Interface Made = 'Access Link' In this mode, only a single IP VC should exist on this interface. The interface and the VC behave like a wire with only one source and one destination.

LAN-TS w/ Interface Made = 'Trunk Minimal' or 'Trunk Full' In this mode VCs with function 'LAN' carry VLAN traffic. VLAN-tagged packets are handled at hardware speeds. Untagged packets match the interface's default LAN and receive the interface's configured routing. When used in a cross-connect entry, a VC with this (LAN-TS) function should be paired with another VC carrying a transport stream.

IP over ATM This VC carries IP on ATM traffic and may serve as a cross connection source or destination. This VC should be connected to an ATM virtual channel that is also configured for IP on ATM (IPOA) traffic.

MPEG RTP Rx This VC receives RTP-encapsulated (see note below) MPEG traffic from an interface connected to external equipment and serves as a cross connection source. This VC should be cross-connected to any destination that consumes MPEG transport stream data.

MPEG RTP Tx This VC serves as a cross connection destination and provides RTP-encapsulated (see note below) MPEG traffic to an external equipment interface at the specified 'IP Address' and 'Port'. Any NetVX source that creates MPEG transport stream data can be cross-connected to this VC.

MPEG TS Rx This VC receives MPEG traffic from an interface connected to external equipment and serves as a cross connection source. This VC should be cross-connected to any destination that consumes MPEG transport stream data.

MPEG TS Tx This VC serves as a cross connection destination and provides MPEG traffic to an external equipment interface. Any NetVX source that creates MPEG transport stream data can be cross-connected to this VC.

M/H RTP Rx This VC receives IP/RTP traffic from the network, encapsulates the data in transport stream packets, and forwards the traffic across the backplane. One or more M/H services specify the sources of incoming data. M/H services use their VC index to reference specific IP virtual VCs, and their IP address and port specify the sources for the VC's incoming M/H data.

These streams are aggregated and encapsulated into TS packets. The VC's own IP address and port specify the source of signaling data (M/H tables, etc.) These data are also encapsulated into TS packets and sent across the backplane. As a receiver, this VC may serve as the source of a cross-connect entry; the VC should be connected to another VC that consumes MPEG transport stream data.

M/H RTP Tx This VC transmits M/H transport stream traffic encapsulated in RTP streams according to RFC's 3640 and 3984. The VC consumes MPEG transport stream data (with H.264 video and AAC-HEv2 audio) from the backplane, adds RTP/RTCP headers, and supplies the RTP/RTCP packets to its interface for transmission. As a transmitter, it may serve as the destination of a cross-connect entry; the VC should be connected to another VC that produces MPEG transport stream data. The VC's IP address and port specify the destination of the IP data. The number of ports used depends on the number of components in the M/H transport

stream. Each incoming component (audio, video, data...) uses two ports, allocated consecutively starting from the specified port number.

Note: Real Time Protocol (RTP) is handled according to IETF RFC 2250. RTP supports the correction of out of order packets and optionally, forward error correction.

Enable Degrade Alarms (checkbox)

Check this box to enable notification of Virtual Channel Fault Alarms. See "VC Degrade Alarms" on page 504 for details.

Enable Fault Alarms (checkbox)

Check this box to enable notification of Virtual Channel Fault Alarms. See "VC Fault Alarm" on page 509 for details.

13.5.2 Config > IP Modules > VC Control > Network Dialog

Current Function

See the description for "Function" on page 410 and Section 13.5.7, "Overview of VC 'Function' and 'IP Address' Setting Dependencies" on page 419.

IP on ATM

IP Address

Indicates the 'IP Address' assigned to the VC selected in the 'Entries' list. See "IP Address, UDP Port" on page 415 for details.

Note: In 'MPEG RTP Tx' mode this field indicates the Multicast Group address.

Virtual LAN

VLAN ID

Specifies this virtual channel's VLAN identifier.

0	Indicates that the tag header contains only user priority information; otherwise, this VLAN identifier is identical to an untagged frame.
1 to 4094	Range of usable VLAN identifiers.
4095	This is a reserved value which should not be used as VLAN identifier.

Transport Stream

Rx Policing Rate (Mbps)

Specifies the gross input policing bitrate. This rate is all-inclusive (includes both payload and overhead. Data are dropped if the rate is exceed. The value '0' disables policing.

Note: The VC upper bandwidth ingress limit is governed by module's overall ingress limit. This limit is specified in Table 17-2, "Module Ingress and Egress Bandwidth" on page 514.

Note: * The 'Policing Rate' specifies the maximum rate at which data shall flow through this VC. Data exceeding this rate are dropped. If this VC is connecting to an ATM VC for LAN extension, then care must be taken to ensure that: (1) This VC's 'Policing Rate' does not over-run the maximum possible rate available to the ATM VC and, (2) This VC's 'Policing Rate' matches the ATM VC's 'Payload Rate'.

TS Packets/IP

Use this control to specify the number of transport stream packets per IP packet received on this VC.

Ensemble ID

Use this field to specify the Ensemble ID when creating an MH service. This field displays the configured value thereafter.

13.5.3 Config > IP Modules > VC Control > MPEG Rx, Multicast Dialog

Current Function

See the description for "Function" on page 410 and Section 13.5.7, "Overview of VC 'Function' and 'IP Address' Setting Dependencies" on page 419.

Group Address

Use this field to specify the source IP multicast 'Group Address'.

Multicast Sources

Source Address

Use these controls to specify the multicast source address for one or more multicast groups. 'Upstream' routers can use this value in their interactions with other routers to establish an optimized path.

0.0.0.0 Configuring a zero IP address (0.0.0.0) specifies no particular source, thus requesting packets from a known group (but unknown sender). If the routers in the network do not support IGMP version 3, they will not filter the packets according to the source address; the client might still receive packets from other originators.

<ip address> * When joining a multicast group IGMP version 3 allows one to specify the desired source address. Assuming cooperation from its router, a channel specifies both the multicast group (the channel's IP address) and also the desired originator of that group.

No central authority yet assigns multicast group addresses, so it is possible for multiple uncoordinated servers to transmit packets for the same multicast group. Before IGMP version 3, one could receive packets from an unintended multicast group (or even conflicting packets from multiple groups). Using IGMP version 3, a multicast group client can indicate to routers the specific group it wants to join, thus letting the routers deflect packets from the client that originate from other groups.

Note: This parameter does not function as a filter operating on incoming data but rather, it provides information to 'upstream' routers.

Note: * Always specify a source address for any multicast being received in the 232.x.x.x group. Do not specify any source addresses for multicasts being received in groups 226.x.x.x through 231.x.x.x.

Note: The GBE-C11 cannot (yet) filter its own packets by source address. If two streams arrive with the same multicast group address but from different sources, the GBE module will not be able to separate them.

13.5.4 Config > IP Modules > VC Control > MPEG Rx Dialog

Function

See the description for "Function" on page 410 and Section 13.5.7, "Overview of VC 'Function' and 'IP Address' Setting Dependencies" on page 419.

UDP Port

Use this field to specify the UDP port for the source stream this VC will receive data from.

MPEG Processing

Use this control to specify the MPEG processing for this virtual channel. This value applies to IP channels transmitting MPEG transport stream data or and generating RTP parity packets according to RFC 2733.

Note: This setting is only applicable to VCs that have their 'Function' set to either 'MPEG RTP Tx', or 'MPEG TS Tx'. MPEG receivers and other VC functions ignore the value.

Constant Bitrate Choose this option for a constant bitrate transport stream.
The NetVX inserts null transport stream packets to increase the channel's transmit rate to the required value.

Variable Bitrate Choose this option for a variable bitrate transport stream. On output, the NetVX reads packets out of their buffer at the highest rate possible without exceeding the configured output rate. No null packets are inserted.

FEC Port

Indicates the UDP port used to carry forward error correction (FEC) data for this VC. This port number is always +2 from the UDP port specified in the 'VC Control' dialog.

TS Packets/IP

This control indicates the number of transport stream packets per IP packet received on this VC.

13.5.5 Config > IP Modules > VC Control > MPEG Tx, Network Dialog

Function

See the description for "Function" on page 410 and Section 13.5.7, "Overview of VC 'Function' and 'IP Address' Setting Dependencies" on page 419,

Entries

Lists all virtual channels (VCs) configured on this interface. Highlight any VC in the list of entries to see its current rate settings.

IP Address, UDP Port

Use this field to specify an IP address, and possibly a UDP port, to associate with this IP VC.

The VC's IP address is used to either select packets from a sender or to designate a specific destination. The VC's IP address is distinct from the interface's IP address. With the exception of multicast packets, the interface uses its own address to identify incoming packets intended for other recipients. This interface filter is applied before performing VC processing. Section 13.5.7, "Overview of VC 'Function' and 'IP Address' Setting Dependencies" on page 419 describes how the VC's 'Function' setting the use of the 'IP Address' value.

Note: See the description of the IP Mode parameters 'Trunk Full' and 'Trunk Minimal' for details on IP address assignments and the appropriate subnetting that should be assigned for each mode.

Output

Payload TX Rate (Mbps)

Specifies the VC's transmit payload bit rate. While the Payload TX Rate specified here adds to the stream's overall bit rate, the VC's 'Function' setting also affects the calculation.

mpeg-rtp-tx The overhead for forward error correction is figured into the overall VC bit rate. This approach results in a bit stream that is larger than one that does not use RTP (below).

mpeg-ts-tx The payload rate is the transport stream bit rate.

Note: On the SYS-A12 and SYS-G10 modules, the sum of all IP traffic transmitted and received may not exceed 20 Mbps. The GBE-C11 processes any Video on IP (VIP) traffic it receives directly – this traffic does not affect the system controller. However, all non-VIP IP traffic entering the system through the GBE-C11 is sent to the system controller for routing and contributes to reaching this 20 Mbps limit.

Type of Service (Hex Value)

Use this text box to specify the 'type of service' that should be indicated in the headers of the IP packets transmitted from this VC.

LAN Tx Rate (Mbps)

This read-only field displays a calculation of the total bandwidth this VC will consume (including overhead) at the specified 'Payload Rate'.

Estimated Latency

Indicates the estimated amount of latency (in milliseconds) that shall be added to the signal based up on the 'Payload Rate' and 'Type of Service' options selected.

Interface

Full Rate (Mbps)

This read-only entry indicates the maximum bandwidth available for the interface on which this VC is located.

Available Payload Rate (Mbps)

This read-only entry indicates the amount of remaining payload bandwidth available on the specified interface. The formula for this calculation is as follows.

```
Avail. IP Rate = Full Rate - (LAN Tx Rate for each VC)
```

13.5.6 Config > IP Modules > VC Control > MPEG Tx, Stream Dialog

Abstract: *Use this dialog to specify details about MPEG processing in the Transport Stream.*

Entries

Provides a list of all configured IP virtual channel (IPVC) entries.

Function

See the description for "Function" on page 410 and Section 13.5.7, "Overview of VC 'Function' and 'IP Address' Setting Dependencies" on page 419

MPEG Processing

Use this control to specify the MPEG processing for this virtual channel. This value applies to IP channels transmitting MPEG transport stream data or and generating RTP parity packets according to RFC 2733.

Note: This setting is only applicable to VCs that have their 'Function' set to either 'MPEG RTP Tx', or 'MPEG TS Tx'. MPEG receivers and other VC functions ignore the value.

Constant Bitrate Choose this option for a constant bitrate transport stream.
The NetVX inserts null transport stream packets to increase the channel's transmit rate to the required value.

Variable Bitrate Choose this option for a variable bitrate transport stream. On output, the NetVX reads packets out of their buffer at the highest rate possible without exceeding the configured output rate. No null packets are inserted.

TS Packets/IP

Use this control to specify the number of transport stream packets per IP packet received on this VC.

Forward Error Correction

Forward Error Correction

Use this control to the mode of Forward Error Correction (FEC) for this IP virtual channel. This value applies to IP channels transmitting MPEG transport stream data, generating RTP parity packets according to RFC 2733. This value should be set to 'none' for MPEG receivers and VCs configured for other channel functions. Please see Section 13.5.8, "Overview of IP VC Forward Error Correction" on page 420 for details.

none Disables forward error correction for this channel; use this setting for VCs that do not support FEC.

custom Use this option to manually specify custom FEC period and order values using the 'FEC Period' (described below) and 'FEC Order' (below) commands.

low This is equivalent to setting (fec, period, order) to (custom, 1, 16), generating 1 parity packet for every 16 data packets.

medium This is equivalent to setting (fec, period, order) to (custom, 5, 8), generating 5 parity packets for every 40 data packets.

high This is equivalent to setting (fec, period, order) to (custom, 20, 4), generating 20 parity packets for every 80 data packets.

FEC Port

Indicates the UDP port used to carry forward error correction (FEC) data for this VC. This port number is always +2 from the UDP port specified in the 'VC Control' dialog.

FEC Order

Specifies the FEC order for this virtual channel. The 'order' corresponds to the depth of the conceptual grid used for forward error correction. This setting is applicable only to IP VCs whose 'Function' ("Function" on page 410) is set to 'mpeg-rtp-tx'. Please see Section 13.5.8, "Overview of IP VC Forward Error Correction" on page 420 for details.

FEC Period

Specifies the FEC order for this virtual channel. The 'period' corresponds to the width of the conceptual grid used for forward error correction. This setting is applicable only to IP VCs whose 'Function' ("Function" on page 410) is set to 'mpeg-rtp-tx'.

Please see Section 13.5.8, "Overview of IP VC Forward Error Correction" on page 420 for details.

Note: This parameter is only used when the VC's function is set to 'LAN'.

Estimated Latency (ms)

This field uses a combination of both 'FEC' settings and the bitrate to calculate an stomata of the latency this circuit will experience.

New

Press this button to create a new IP VC entry and enable access to the configuration controls listed above.

Delete

Highlight an entry and click this button to delete it.

13.5.7 Overview of VC 'Function' and 'IP Address' Setting Dependencies

Abstract: *This topic describes how the IP VC's 'Function' setting affects the use of its 'IP Address' field.*

IP VC Function = 'LAN', or 'LAN TS'

In this mode, the IP address parameter is ignored. VCs on each end of the connection simply function like a wire to convey Ethernet traffic.

IP VC Function = 'IP over ATM'

Note: This function is only available for use with IP VCs on the System Controller modules.

Note: See the description of the IP Mode parameters 'Trunk Full' and 'Trunk Minimal' for details on IP address assignments and the appropriate subnetting that should be assigned for each mode.

This value indicates the IP address of the interface on the opposite end of this circuit (the 'next hop'). When an IP VC is configured for IPOA, and it is connected to an ATM virtual channel, Inverse ATM ARP entries are made in one of two possible ways.

0.0.0.0 Inverse ATM ARP is used to determine the IP address of the remote device. The NetVX queries the VC with an ARP request, asking the neighboring network element to send its IP address. If the neighboring system responds to the inverse ATM ARP request, the resulting IP address is added to the inverse ATM ARP table.

<IP Address> Inverse ATM ARP is disabled on this VC, and the specified destination address is used. The address specified must be unique amongst all VCs on the interface or else unexpected results will occur. In most cases, inverse ATM ARP is used and this manual step is not necessary. This option is provided as a workaround for remote equipment that does not properly respond to inverse ATM ARP requests.

IP VC Function = 'MPEG RTP Tx' or 'MPEG TS Tx'

0.0.0.0 Indicates no destination has been configured.

<IP Address> + Port The 'IP Address' and 'Port' together indicate the destination for the MPEG stream. The 'IP Address' and 'Port' combination specified must be unique amongst all VCs on the interface or else unexpected results will occur.

IP VC Function = 'MPEG RTP Rx' or 'MPEG TS Rx'

The VC's IP address and port filter packets for normal IP routing or special video-on-IP handling.

0.0.0.0 This setting indicates no specific source is configured. All packets addressed to the interface's 'IP Address' and the VC's 'Port' are processed as video-on-IP. Packets addressed to some other 'IP Address' and 'Port' receive normal IP routing.

<IP Address> + Port Setting the VC's 'IP Address' designates a multicast group. Packets addressed to that multicast group and the channel's port will be processed as video-on-IP. The 'IP Address' must be unique for all VCs on the interface. Packets addressed to any other 'IP Address' and 'Port' are handled by the normal IP routing. If the network's routers support IGMP version 3, one can further qualify the multicast group with a specific 'Source Address'.

13.5.8 Overview of IP VC Forward Error Correction

Abstract: *This overview describes the interactions between the FEC, Period, and Order settings.*

To enhance error recovery, parity packets can be computed on a repeating, conceptual grid overlaid on the data packets. This grid has period columns (L) and order rows (D), as described by Pro-MPEG Code of Practice #3, January 2003. Beginning with version g.a.a, the GBE module complies with Release 2 of this code of practice.

With forward error correction enabled, the correction packets are sent to and received from a different port from the transport stream packets. Moreover, the channel's transmit rate includes only the transport stream data; error correction overhead (and IP overhead) must be separately computed to determine the entire bandwidth for the video-on-IP stream.

In the MPEG data stream, each IP packet carries up to 7 transport stream packets (see "TS Packets/IP" on page 411), possibly wrapped in additional protocols. Each FEC parity packet carries error correction data for those transport stream packets. That FEC payload rides in an ethernet frame with a 14-byte header, carrying an IP packet with a 20-byte IP header, an 8-byte UDP header, a 12-byte RTP header, and a 16-byte FEC header.

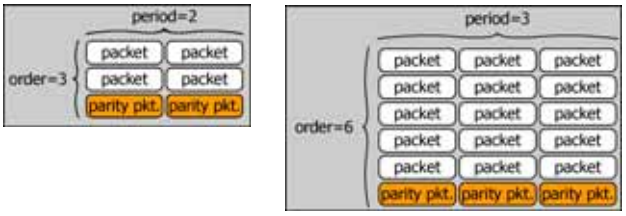


Figure 13-2 How FEC 'Period' and 'Order' Settings Affect Table Size

Table 13-2 How FEC Settings Control 'Period' and 'Order'

FEC Setting Forward Error Correction on page 417	Period Setting(s) FEC Period on page 417	Order Setting(s) FEC Order on page 417	Quantity of Data Packets
None	Ignored	Ignored	—
Custom	1–20 (See Note 1 below)	4–20 (See Note 1 below)	Multiple of the two settings used.
Low	1	16	16
Medium	5	8	40
High	20	4	80

Note: (1) When using the 'Custom' setting, the product of the 'Period * Order' may not exceed 100.
(2) This parameter is applicable only to IP VCs whose 'Function' ("Function" on page 410) is set to 'mpeg-rtp-tx'.
(3) This parameter is only provided by the GBE-C11.

13.5.9 Config > IP Modules > DHCP Dialog

DHCP Relay Agent Properties

Entries
Each entry is used to identify the IP address of any DHCP server accessible by this system. Up to ten DHCP servers may be specified.

Tag
Use this field to name this IP interface. The tag may be up to 31 characters long.

IP Address
Specifies the IP address for each DHCP server entry.

IP Subnet Mask
Specifies the subnet IP address for each DHCP server entry.

13.6 IP Module Status

13.6.1 Status > IP Modules Table

This table indicates the MAC address, rate, and packet counts associated with each IP module's Ethernet adapter.

13.6.2 Status > IP Modules > Interface Tab

This table indicates the link status (rate) and the MAC address associated with each IP module's Ethernet adapter.

Link Status

Indicates one of the following.

eth-10BaseT	The interface has detected a 10BaseT signal (full duplex).
eth-10BaseT-half	The interface has detected a 10BaseT signal (half duplex).
eth-100BaseT	The interface has detected a 100BaseT signal (full duplex).
eth-100BaseT-half	The interface has detected a 100BaseT signal (half duplex).
eth-1000BaseT	The interface has detected a 1000BaseT signal (full duplex).
lost	The interface has lost link connectivity with its ethernet. Depending on the internal state of the module, this value can apply to the optical, electrical, or both components.
negotiating	Some interfaces can communicate at several speeds, and they often negotiate an acceptable speed with the device at the other end of the wire. This value indicates the startup negotiation is still in progress. Depending on the internal state of the module, this value can apply to the optical, electrical, or both components.
optical	The interface has detected an optical signal.
unknown	The interface status is unknown. This sometimes happens when the hardware does not respond to status requests, but this should be a temporary condition.

MAC Address

Indicates the MAC address of the selected interface.

Optical Attributes

Indicates the interface's optical attributes (if any). IP modules can detect various static and dynamic characteristics of their interface(s). Some characteristics, such as the link status have their own status variables. If an interface has an optical component, the module represents its attributes (such as laser type, signal strength, etc.) in this variable. The text string is intended for operator convenience; its format and contents are unspecified. If the module does not have an optical interface, this parameter indicates 'Not Present' or similar text.

IGMP Version

Indicates the IGMP version for the interface.

unknown	The interface has not yet received an IGMP poll from the router that would allow it to determine what version of IGMP to use.
v1, v2, v3	The interface is using IGMP version 1, 2, or 3.

Note: IGMP version 3 provides additional features over version 1 and 2, such as the ability to designate a particular originator for a multicast group.

IP Rx Rate (Mbps)

Indicates the computed receive total bitrate on this interface. This value gives the full bandwidth, including IP headers and non-IP data, independent from the payload. Consequently, the system can monitor the incoming traffic without having to parse the data.

Rx IP Pkts

Indicates the total count of Ethernet packets received on this interface.

Rx Data Rate (Mbps)

Indicates the computed receive data bitrate on this interface. In this context, data rate include all packets except those associated with channels carrying MPEG.

Rx Data Packets

Indicates the number of data packets received on this interface. In this context, data packets include all packets except those associated with channels carrying MPEG.

Rx Data Buffer Errored Seconds

Indicates the errored second count for receive data buffer errors on this interface. In this context, data includes everything except those packets associated with channels carrying MPEG. Some IP modules without their own IP routing stack move received data packets from the input buffer, across the backplane, to an IP module with routing (such as the system controller). If, however, too many data packets arrive or something slows the pipeline, the data receive buffer can overflow, causing packets to be discarded.

Rx Error Pkts

Indicates the number of errored packets received on this interface. Errors include a bad CRC and any other conditions that show packet corruption.

Rx Buffer Errored Seconds

Indicates the errored second count for receive buffer errors on this interface. The IP module normally moves received packets from the input buffer through the processing chain. If, however, something slows the pipeline, the receive buffer can overflow, causing packets to be discarded.

Rx Errored Seconds

Indicates the receive errored second count on this interface. Generally, this error category includes conditions that originate inside the NetVX itself. This composite value depends on the following status variables.

- Rx Buffer Errored Seconds
- Rx Data Buffer Errored Seconds
- Rx Error Pkts

To determine errored seconds, the active interface specifies what variables contribute to the composite value. Given those status variables, there may be two types: counters and enumeration values. If a counter changes, that second is considered to have an error. The actual number of errors in the one-second interval does not matter (as long as it is non-zero). Similarly, an enumeration variable contributes to an errored second if the value indicates an error condition. Some values are fault/noFault/unknown; others are present/notPresent/unknown.

This variable contributes to the 'Network Degrade – Errors in Input Signal' alarm.

IP Tx Rate (Mbps)

Indicates the computed transmit total bitrate on this interface. This value gives the full bandwidth, including IP headers and non-IP data, independent from the payload. Consequently, the system can monitor the outgoing traffic without having to parse the data.

Tx IP Pkts

Indicates the total count of Ethernet packets transmitted on this interface.

Tx Optical Signal

Indicates the status of the optical transmitter signal on this interface.

degrade	An optical transmitter is in use, and its performance is degraded. Though the optical component is not necessarily defective, this usually indicates a problem with the hardware. This condition is less severe than fault, but it may cause 'Module Degrade – General Degrade' alarm. When asserting an alarm condition, the module should include diagnostic information in the alarm's description.
fault	An optical transmitter is in use and its performance is outside acceptable bounds. This usually indicates defective hardware and may cause the 'Module Fault – General Fault' alarm. When asserting an alarm condition, the module should include diagnostic information in the alarm's description.
none	This interface does not have an optical transmitter, or that transmitter is not currently in use.
normal	The interface's optical transmitter is in use and is operating normally.
unknown	The interface cannot obtain information about the transmitter. This value occurs when the interface should (or could) have an optical transmitter, but its status is unavailable. This might be caused, for example, when the interface could have an optical component, but the part physically has not been installed.

Tx Data Rate (Mbps)

Indicates the computed transmit data bitrate on this interface. In this context, data rate include all packets except those associated with channels carrying MPEG.

Tx Data Packets

Indicates the number of data packets transmitted on this interface. In this context, data packets include all packets except those associated with channels carrying MPEG.

Tx Errored Seconds

Indicates the transmit errored second count on this interface. Generally, this error category includes conditions that originate outside the NetVX itself. This composite value depends on the Tx Buffer Overflow Seconds status variables.

The TX Errored seconds count is a composite of 'counter' and 'enumeration'-type status variables.

- Any second in which an error counter increments is considered an 'errored second'. The actual number of errors in the one-second interval does not matter (as long as it is non-zero).
- An enumeration variable contributes to an errored second if the value indicates an error condition.

Tx Buffer Overflow Seconds

Indicates the errored second count for transmit buffer overflow on this interface. The IP module normally moves outgoing packets through the processing chain to the output buffer. If, however, something slows the pipeline, the transmit buffer can overflow, causing packets to be discarded. This variable contributes to the 'Network Degrade – Transmit Buffer Overflow' alarm.

13.6.3 Status > IP Modules > IP Routing Table Tab

This table displays the complete IP routing table. This table contains all manually-entered static routes as well as routes added by the operating system.

Note: Each entry in the routing table must designate a unique combination of subnet and subnet mask.

IP Address

Identifies this entry's destination IP address.

IP Subnet Mask

Identifies this entry's IP subnet mask.

Next Hop IP Address

Identifies the next address for packets en route to the destination IP address.

Distance

Identifies the number of intermediate routers that must be traversed to reach the IP address specified for this entry.

Source

Indicates the origin of the routing table entry.

Direct Indicates this entry is an IP address on this NetVX.

Static Indicates a manually (statically) configured IP address.

RIP Indicates an entry automatically created by the RIP protocol.

13.6.4 Status > IP Modules > Virtual Channel Tab

Abstract: *This table summarizes the status of all IP VCs operating on all IP modules.*

IP Rx Rate (Mbps)

Indicates the computed receive IP bitrate on this VC. This value gives the IP packet bandwidth, independent from the payload. Consequently, the system can monitor the incoming traffic without having to parse the data.

IP Tx Rate (Mbps)

Indicates the computed transmit IP bitrate on this VC. This value gives the IP packet bandwidth, independent from the payload. Consequently, the system can monitor the outgoing traffic without having to parse data.

Payload Rx Rate (Mbps)

Indicates the receive payload bitrate on this VC. This value gives the bitrate of data received from the external interface and directed to this VC.

Payload Tx Rate (Mbps)

Indicates the transmit payload bitrate on this VC. This value indicates the bitrate of data sent from this VC to and external interface.

Inverse ATM ARP Address

This value indicates the IP address of the interface on the opposite end of this circuit (the 'next hop'). When an IP VC is configured for IPOA, and it is connected to an ATM virtual channel, inverse ATM ARP entries are made in two ways.

- The NetVX queries the VC with an ARP request, asking the neighboring network element to send its IP address. If the neighboring system responds to the inverse ATM ARP request, the resulting IP address is added to the inverse ATM ARP table.
- The IP address is manually configured.

Please see Section 3.7.7, "Overview of NetVX Inverse ATM ARP Functionality" on page 90.

Errors

Rx Corrected Packets

Maintains a count of corrected packets received on this VC.

Rx Discarded Packets Seconds

Maintains a count of every second in which an IP packet is discarded on this VC.

Rx Discarded Fragmented Packet Seconds

Maintains a count of every second in which a fragmented video on IP packet is received on this VC.

Rx Uncorrectable Packets

Maintains a count of uncorrectable packets received on this VC.

Rx Errored Seconds

Maintains a count of errored seconds on the receive interface. Discarded, fragmented, uncorrectable errors all increment this count.

Tx Errored Seconds

Maintains a count of errored seconds on the transmit interface. This value increments whenever

Tx Failure

Indicate IP transmission failure. A text message describing the cause of the failure is provided in this row whenever a failure occurs.

Tx Buffer Overflow Seconds

Maintains a count of the number of seconds that the transmit buffer is overflowed

Traffic

Rx IP Packets

Maintains a count of the number of IP packets received on this interface.

Rx Delay Variation (ms)

Indicates the computed receive delay variation, in milliseconds, on this VC.

FEC Order

Indicates the detected receive FEC order on this VC. When a VC is configured to carry MPEG with Forward Error Correction (FEC), the FEC data are generated with stable characteristics. This parameter reports the 'order' (number of rows) in the FEC grid. If the VC does not have forward error correction or the order has not been determined, this value will be zero.

FEC Period

Indicates the detected receive FEC period on this VC. When a VC is configured to carry MPEG with Forward Error Correction (FEC), the FEC data are generated with stable characteristics. This parameter reports the 'period' (the number of columns) in the FEC grid. If the VC does not have forward error correction or the period has not been determined, this value will be zero.

Tx IP Packets

Maintains a count of the number of IP packets transmitted through this interface.

Rx Transport Stream

Rx Transport Stream Packets

Maintains a count of the number of transport stream packets received on this interface.

TS Packets per IP

Indicates the detected number of transport stream packets per IP packet received on this VC.

Tx Transport Stream

Tx Transport Stream Packets

Maintains a count of the number of transport stream packets transmitted through this interface.

Chapter 14: NetVX Redundancy & Service Protection

14

14.1 Overview

Abstract: *This chapter describes the NetVX Video Networking System's redundancy features and configuration procedures.*

The NetVX provides two forms of redundancy protection, Module Redundancy and Path Redundancy. Other key terms for describing and understanding the NetVX redundancy are provided below.

Module Redundancy

One module operates as the backup for one or more other, like modules. This feature is described in the section below titled "General Module Redundancy Procedures" on page 431.

The NetVX supports module redundancy for all its application modules, except the SYS-G10. During a failover or failback event, the NetVX internally manages the transition from one application module to the module's backup. Specifically, the NetVX ensures the following.

- The backup module is brought 'online'.
- The configuration present on the failed module at the time of failure is transferred to the backup module.
- The failed module is brought 'offline'.
- A 'switch' signal is sent to an external router via the NetVX's rear serial port The router is responsible for switching signals between the primary and backup application modules whenever a module failover or failback occurs.

Path Redundancy

One cross connection operates as a backup for another. Active and backup cross connections must have the same destination but may have different types of MPEG video sources; such as an ATM VC carrying MPEG video and an encoder. This feature is described in the section titled "Overview of Cross Connection Redundancy" on page 446.

Main Modules

Main modules are those modules normally responsible for processing audio/video/data signals. Use the steps described in "How to Configure a Main Module" on page 432 for each main module.

Backup Modules

Backup modules take over when a main module fails. Each backup module protects one or more main modules. Please review the "Overview of Network Module Redundancy" on page 443, and then use the steps in "How to Configure a Backup Module" on page 434.

Backup Group

Each association of one or more main modules and a backup module is considered a 'backup group'. There is no restriction as to the number of backup groups, however, all modules in each group must be of the same model-type number (e.g. ENC-S11, DEC-S11, etc.) Some of the various backup relationships are described in more detail in "Overview of NetVX Multiple-Module Redundancy" on page 441.

Router Configuration

Each type of module redundancy application requires external equipment, such as a router or switch, and supporting wiring. The following topics describe the settings used to configure the NetVX to signal external devices in the event of a failover.

- "Receive Interface Router Settings" on page 450.
- "Transmit Interface Router Settings" on page 458.

Distributed Redundancy

The NetVX also supports the use of backup encoding modules located in a separate NetVX chassis. See "How to Configure Distributed Redundant Encoders" on page 435 for details. Note: Both NetVX systems must contain a GBE-C11 module to support this feature.

Related Topics: Router Wiring

These topics provide wiring diagrams, and examples of settings for each type of redundancy application.

- "Using an NxN Router with Encoder Module Receive Interfaces" on page 451.
- "Using an 8x1 Digital Router with Encoder Module Receive Interfaces" on page 454.
- "Using an 8x1 Analog Router with Encoder Module Receive Interfaces" on page 456.
- "Using a NxN Digital or Analog Router with Module Transmit Interfaces" on page 459.
- "Overview of Network Module Redundancy" on page 443.

Related Topics: Failover and Failback Procedures

These topics describe basic procedures related to redundant application modules.

- "How to Identify a Module Failover" on page 438.
- "How to Cause a Service to Failover" on page 439.
- "How to Cause a Service to Failback" on page 440.

14.2 General Module Redundancy Procedures

14.2.1 Overview of Backup Module Compatibility

Abstract: *This topic describes how to determine if primary and backup modules are compatible for a given application.*

The NetVX always permits modules with the same base type and key to operate as 'Main' and 'Backup' modules.

If a backup module is the same base type, but has a different key, then care must be taken to ensure the backup module has sufficient features to cover for the main module in the even of a failure.

Use the following steps to compare the features of a 'Main' module with those of a 'Backup' module.

1. Open Vidiem™.
2. Click 'View > Status' to open Vidiem™'s 'Status View'.
3. Place a check mark in the box next to the device in the Status tree that you wish to monitor.
4. Double click the branch representing the device in the Status tree. The branch expands to show sub-branches.
5. Click on 'Modules'.
6. In the table in the right-hand side of the screen, double-click on the purple 'Detected Module Type' cell to expand and reveal the rows below.
7. Go to the 'Features' row and find the column representing the Main module. Carefully note the features described for that module.
8. Find the column representing the Backup module. Carefully note the features described for that module.
9. Ensure that the features provided by the Backup module are sufficient to support the Main module as it is being used in your application.

Note: When the keyed features of the backup module are not identical to those of the main module, then the backup module must be configured as its base type. Module base types appear in the drop down list as seven-character names such as: DEC-S11, ENC-S11, AUD-D14, ATM-M11, etc. (Note: This list is not exhaustive).

⚠ WARNING!

Warning: Any feature on a Main module that is not present on that module's Backup will fail to work in the event of a failover.

Example 1

An 'ENC-H11-PRO-DMC' is keyed to provide all the features available to a High-Definition encoder module. Therefore this module can back up any other ENC-H11 module.

Example 2

An 'ENC-S21-STD-D' is keyed to provide Dolby AC-3 2.0 audio encoding. An 'ENC-S21-STD-M', which is keyed to provide MPEG Layer 2 (Musicam) Audio encoding, **cannot** backup this module; the audio encoding would fail.

However, the 'ENC-S21-STD-D' could be backed up by an 'ENC-S21-STD-DM' because its features (both Dolby and Musicam support) are a super-set of those on the 'ENC-S21-STD-D'.

Bottom Line: Check that the features in use in the Main Module are supported in the backup module used to support that module (as described above).

Example 3

The ATM-X11 can back up any ATM module such as the ATM-M11, ATM-S11, ATM-L11 provided the two modules share the same feature key.

⚠ CAUTION!

Caution: When using the ATM-X11 as a backup, verify that the signal type of the ATM-X11's SFP module matches the signal type of the ATM module it is backing up (e.g. multi-mode, single-mode, etc.)

Related Topics

"System and Module Types and Keyed Features" on page 472 provides a feature matrix for every module type. Compare features in these tables for compatibility in your application.

"How to Configure a Main Module" on page 432
"How to Configure a Backup Module" on page 434

14.2.2 How to Configure a Main Module

Use the following steps to configure each main module.

1 Select 'Modules > (right click) Properties' in the navigation tree.
- In the 'Module Properties' dialog, highlight the slot containing the module that you want to act as a main module.
- If the module type for this slot is not defined, use the 'Module Type' drop down to specify the type of module that will occupy this slot.
- If the module is installed in the system, check 'Enable for Operation'. Otherwise go back and check this box after the module is installed.
- Select 'Use as Main', under 'Protection' in the bottom half of the screen.
- Use the 'Protection Module' drop-down to select the slot containing the backup module protecting this module.

2 Repeat the preceding steps for any other main modules you wish to protect.

3 Press the 'OK' button to dismiss the 'Module Properties' dialog.

4 Main modules providing network path protection require the following additional steps.

Configuration Steps Specific to ATM Modules

Use the following steps to configure a main ATM module in a redundant application.

Note: An ATM module failover is triggered when an AIS signal is received by a 'Main' ATM module. Please see Section 14.4.1, "ATM Path Protection: Using Redundant ATM Modules" on page 443 for details.

5 Select 'Modules > ATM Interfaces', then right-click on the desired interface and select 'Properties'. The system opens the 'ATM Properties' dialog.
- Check the 'Enable Network Degrade Alarms' checkbox.
- Check the 'Enable Network Fault Alarms' checkbox.
- Check the 'Enable Protection on Network Fault' checkbox.
- Press the 'OK' button to dismiss the 'ATM Properties' dialog.

⚠ WARNING!

Warning: This procedure **must also** be repeated on the far-end network module (across the network) that this module will communicate with. Only when modules on both sides of the ATM network are configured to operate as main modules with redundant backups will the redundancy feature be effective.

Configuration Steps Specific to IP Modules

Use the following steps to configure a main IP module in a redundant application.

Note: An IP module failover is triggered when a 'Main' IP module experiences a loss of LINK signal. Please see Section 14.4.3, "IP Path Protection: Using Redundant IP Modules" on page 445 for details.

6 Select 'Modules > IP Interfaces', then right-click on the desired interface and select 'Properties'. The system opens the 'IP Properties' dialog.
- Check the 'Enable Network Degrade Alarms' checkbox.
- Check the 'Enable Network Fault Alarms' checkbox.
- Check the 'Enable Protection on Network Faults' checkbox.
- Press the 'OK' button to dismiss the 'IP Properties' dialog.

7 Select 'Device > Write…' to write these changes to the system.

Related Procedures

"Config > Module Properties Dialog" on page 238
"General Module Redundancy Procedures" on page 431
"How to Configure a Backup Module" on page 434
"Config > Utilities > Protection Modules Dialog" on page 468

14.2.3 How to Configure a Backup Module

Use the following steps to configure each backup module.

1 Select 'Modules' in the navigation tree and right-click on 'Properties'.

1a In the 'Module Properties' dialog, highlight the slot containing the module that you want to act as a backup (or 'protection') module.

1b Click on and highlight the desired slot in the list on the left.

1c Use the 'Module Type' drop down to specify the type of module that will occupy this slot (if not defined already).

Note: If the keyed features of the backup module are not identical to those of the main module, then please review "Overview of Backup Module Compatibility" on page 431 for details concerning this decision. When the keyed features of the backup module are not identical to those of the main module, then the backup module must be configured as its base type. Module base types appear in the drop down list as seven-character names such as: DEC-S11, ENC-S11, AUD-D14, ATM-M11, etc. (Note: This list is not exhaustive).

Note: An ATM-X11 module can back up any other ATM module. When using optical interfaces, ensure that the interface types (single-mode, multi-mode, or long-reach) are matching on both the main and the backup module before configuring the backup.

2 Check the 'Enable for Operation' checkbox.

2a Determine whether the module is located either (a) At the end of a backup chain, or (b) At an intermediate point within a backup chain. The concept of backup chains is described in "Overview of NetVX Multiple-Module Redundancy" on page 441.

- Click the 'Use as Backup' radio button if the module is at the end of backup chain.
- Click the 'Use as Main' radio button and choose 'Protected by Slot <#>' if the module is located at in intermediate point within the backup chain.

2b [Optional] Encoders and decoders can use the NetVX's serial port to control an external router. Use the 'Router Serial Port' drop-down to indicate which NetVX serial port is used to signal the router to failover and failback signals. This approach to failover is described in the following topics.

- "Receive Interface Router Settings" on page 450.
- "Receive Interface Redundancy Wiring and Configurations" on page 451.
- "Transmit Interface Router Settings" on page 458.
- "Transmit Interface Redundancy Wiring and Configurations" on page 459.

3 Repeat the preceding steps for any other modules that you wish to operate as backup modules.

4 Press the 'OK' button to dismiss the 'Module Properties' dialog.

5 Select 'Device > Write…' to write these changes to the system.

Related Procedures

"Config > Module Properties Dialog" on page 238
"General Module Redundancy Procedures" on page 431
"How to Configure a Main Module" on page 432
"Config > Utilities > Protection Modules Dialog" on page 468

14.2.4 How to Configure Distributed Redundant Encoders

Abstract: *In configurations where an encoder provides its output over IP. One NetVX system can use an encoder in an separate NetVX system as a backup. This procedure describes how to configure these systems. This feature became available in release 7.5.0.*

In this procedure, the NetVX system hosting the primary encoding module is referred to as the 'local' system. A separate NetVX system hosting the backup encoding module is referred to as the 'remote' system.

Note: When a remote backup encoder is active, a reset/reboot of either the main system or the backup system will interrupt the encoding service for a period lasting up to two minutes.

Prerequisites

1. A Gigabit Ethernet (GBE) module must be installed in each system.
2. All GBE modules and System Controller modules must be co-located on the same subnet.
3. An encoder module must be installed in each system. Encoders must be key-compatible.
4. The primary encoder must be configured as desired. The backup encoder does not need to be configured. In the event of failure, the configuration from the failed module is copied to the backup encoder.

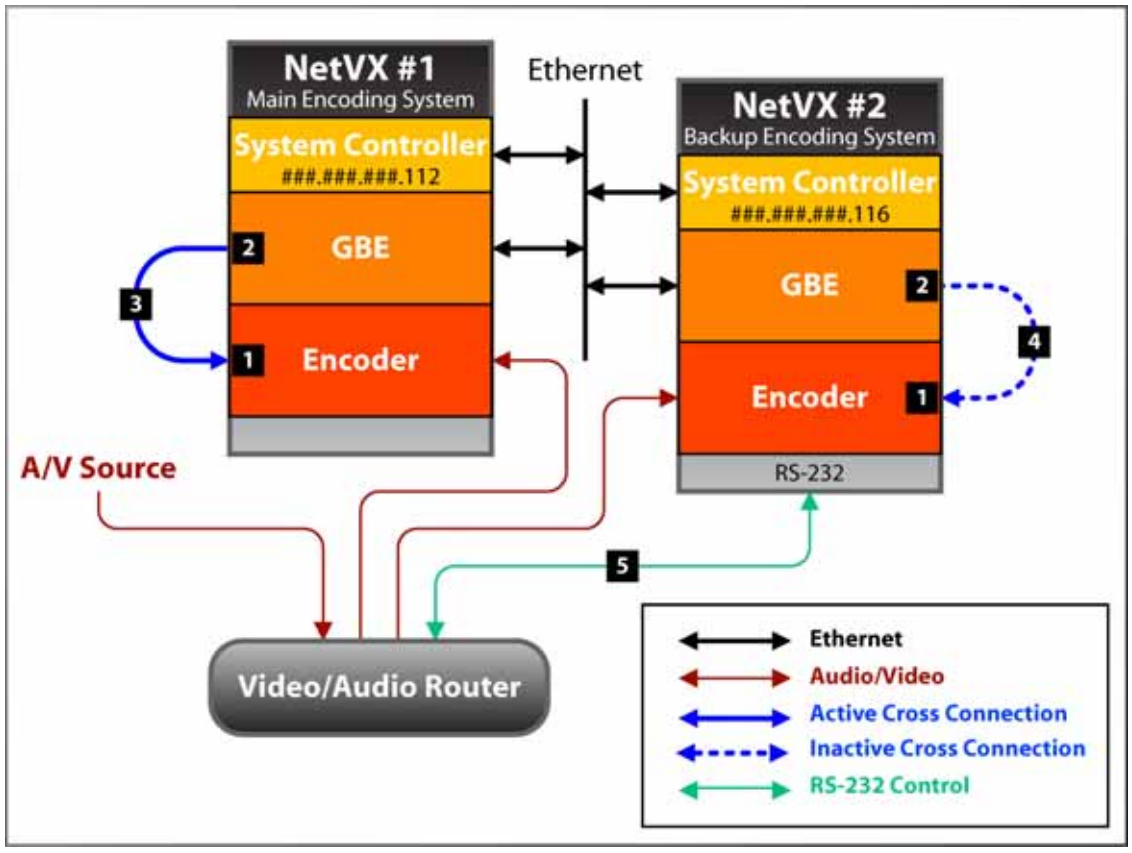


Figure 14-1 Distributed Redundancy Using Gigabit Ethernet

The Figure 14-1 above shows a simple example of an encoder in one system providing backup for an encoder in another system. The number of systems and the number of operating modules in each system may be much greater than is shown here.

In this example, both systems are connected on the same IP subnet as is required for distributed encoding backup solutions.

As in other redundancy scenarios, a video/audio router is required to manage connections feeding each encoder.

Remote Failover Operations

In the event the primary encoder fails, the system controller in the primary system issues a broadcast message to all system controllers sharing its same multicast address. The backup is handled by the first system to respond to this message (again, there may be many such systems) however this scenario shows only one system. The backup system responds. The primary system controller sends a copy of the failed module's configuration to the system controller in the backup system. The backup system's controller then configures the backup module using this configuration information.

Procedure

1. Configure *both* NetVX System Controllers to share the same multicast address.
   - In the navigation tree, right-click on 'System' and select 'Properties' from the floating dialog.
   - In the 'System Properties' dialog, expand the 'Fundamentals' branch and click on the 'Controls' sub-branch.
   - In the 'Controls' dialog, set the Multicast address.
2. Configure the encoder on the 'Main Encoding System' only.
   - Configure audio and video encoding as desired.
   - Note the 'TS Rate' assigned to this program.
3. Create and configure VC on the Gigabit Ethernet module in each system.
   - Double-click the GBE module in the navigation tree to open the 'IP Properties' dialog.
   - Click on 'VC Control' in the sub-navigation menu to open the 'VC Control' dialog, then set the 'Function' to 'MPEG TS Tx'.
   - Click on 'MPEG TX, Network' in the sub-navigation menu and set (1) The IP Address to a subnet that shall be shared amongst related GBE VCs supporting this function. (2) Set a unique 'IP Port', (3) Set the 'Payload Tx Rate' to the previously-noted rate. (4) Configure the 'Type of Service' to the desired value.
   - Click on 'MPEG Processing' in the sub-navigation menu and set (1) 'MPEG Processing' to 'Constant Bitrate', and (2) 'TS Packets/IP' to the desired value.
4. Create a cross connection on each system to link the encoder to the VC on the Gigabit Ethernet module created above.
5. Configure the cross connection on the Main system.
   - In the navigation tree, select 'System > Cross Connections' to get to the cross connections tab.
   - Double-click the cross connection to open its dialog.
   - Ensure the 'State' is set to 'Active' on the cross connection connecting the Encoder to the GBE modules on the Main system.
6. Configure the cross connection on the Backup system.
   - In the navigation tree, select 'System > Cross Connections' to get to the cross connections tab.
   - Double-click the cross connection to open its dialog.
   - Ensure the 'State' is set to 'Backup' on the cross connection connecting the Encoder to the GBE on the Backup system.
7. Connect one of the backup NetVX system's RS-232 ports to the router and configure it as described below.
   - In the Navigation tree select 'System' and double-click on 'Auxiliary Serial Ports'.
   - In the 'Entries' list on the 'Auxiliary Serial Ports' dialog, highlight the serial port used above.
   - Set the 'Baud Rate' to the rate that is appropriate for you router.
   - Set the Function' to 'Router, Leitch'.
8. Configure the 'Protection Mode' of the primary encoder on the 'Main Encoding System'.
   - In the Navigation tree right-click the 'Modules' branch and select 'Properties' to open the 'Module Properties' dialog.
   - Click on the encoder in the list of the left.
   - Place a check mark on 'Enable for Operation' if needed.
   - Click the 'Use as Main' radio button.
   - Select 'Protected by External'.
9. Press the 'OK' button to dismiss the 'Module Properties' dialog.
10. Select 'Device > Write…' to write these changes to the 'Backup Encoding System'.

11 Configure the ‘Protection Mode’ of the backup encoder on the ‘Backup Encoding System’.
- In the Navigation tree right-click the ‘Modules’ branch and select ‘Properties’ to open the ‘Module Properties’ dialog.
- Click on the encoder in the list of the left.
- Place a check mark on ‘Enable for Operation’ if needed.
- Click the ‘Use as External Backup’ radio button.

12 Press the ‘OK’ button to dismiss the ‘Module Properties’ dialog.

13 Select ‘Device > Write…’ to write these changes to the ‘Backup Encoding System’.

14.2.5 How to Identify a Module Failover

The NetVX provides four indications of a module failover.

Traps

Vidiem™ displays traps it receives in its trap log. This feature requires the following:

- An operable PC with Vidiem™ installed.
- A NetVX configured to emit traps to the PC.
- IP connectivity between the PC and the NetVX.

Module Fault LEDs

Each module (except the SYS-G10 System Controller) has a Fault LED. This LED illuminates red when the board has failed, or is experiencing a serious hardware fault.

Front Panel 'Module' LED

The NetVX's front panel 'Module' LED illuminates red when a module should be replaced or repaired. This LED provides a composite status of all the LEDs.

Status View

Vidiem™'s status view indicates when a module has failed. Use the procedure shown below to identify the failed module.

Procedure

1. Choose 'View > Status' from the menu bar.
2. Place a check mark in the square box next to the NetVX system that you wish to monitor (if there is not one there already).
3. Expand the tree under this system, and click on 'Modules' branch.
4. In the table on the right, click the plus sign next to the 'Status' row to display the 'Protection Availability' and 'Failed Slot' rows.
5. Scan across entries in the 'Failed Slot' row to identify any entry other than '0'. Such an entry indicates that the module in the respective column has taken over service from the module in the slot indicated.
6. Use the procedure listed in "How to Cause a Service to Failback" on page 440 to return the system to its original state.

Related Topic

"Trap Log Procedures" on page 161.
"How to Cause a Service to Failover" on page 439.
"How to Cause a Service to Failback" on page 440.

14.2.6 How to Cause a Service to Failover

Abstract: *Use this procedure to cause a service to failover from a main module to the module's backup. This procedure is helpful when a main module requires servicing and you do not wish to drop its feeds.*

Prerequisites

This procedure requires a main and a backup module configured as per the following procedures.

- "How to Configure a Main Module" on page 432.
- "How to Configure a Backup Module" on page 434.

Procedure

1. Select 'Utilities + (right-click) Properties > Protection' to open the 'Protection Dialog'.
2. Select the 'Failover from Main Module to Backup' option.
3. Select the main module from which you wish to switch service.
4. Click the 'Transfer' button. The NetVX transfers the service from the main to the backup module.

Related Topic

"How to Cause a Service to Failback" on page 440

14.2.7 How to Cause a Service to Failback

Abstract: *Use this procedure to return a service to the main module on which it originally operated prior to a failover.*

Prerequisites

Use this procedure on a system whereby a backup module is actively handling a service that was previously operating on a main module.

Procedure

Preliminary Steps For ATM Modules Only

1. Before failing back to the main ATM module, you must disable the 'Enable Protection on Network Fault' feature on one side of the network. If you do not disable this feature on one side of the network, the system will failback to the main module for just a moment and then failover to the backup again.
    - Select 'Modules > ATM Interfaces', then right-click on the desired interface and select 'Properties'. The system opens the 'ATM Properties' dialog.
    - Un-check the 'Enable Protection on Network Fault' checkbox.
    - Press the 'OK' button to dismiss the 'ATM Properties' dialog.
2. Ensure that the condition which caused the original error on the primary path has been remedied.
3. Select 'Device > Write…' to write these changes to the system.

Steps For all Modules (Including ATM Modules)

4. Select 'Utilities + (right-click) Properties > Protection' to open the 'Protection Dialog'.
5. Select the 'Restore Service to Main Module' option.
6. Select the main module to which you wish to return service.
7. Click the 'Transfer' button. The NetVX transfers the service back to the main module.

Additional Steps For ATM Modules Only

8. You must re-enable the 'Enable Protection on Network Fault' feature in order to again benefit form path protection. Do the following steps on the same module that you performed the tasks in Step 1 above on.
    - Select 'Modules > ATM Interfaces', then right-click on the desired interface and select 'Properties'. The system opens the 'ATM Properties' dialog.
    - Check the 'Enable Protection on Network Fault' checkbox.
    - Press the 'OK' button to dismiss the 'ATM Properties' dialog.
9. Select 'Device > Write…' to write these changes to the system.

Related Topic

"How to Cause a Service to Failover" on page 439

14.3 Overview of NetVX Multiple-Module Redundancy

Abstract: *This procedure explains the operational principles of a 'Many-to-Many' module redundancy configuration.*

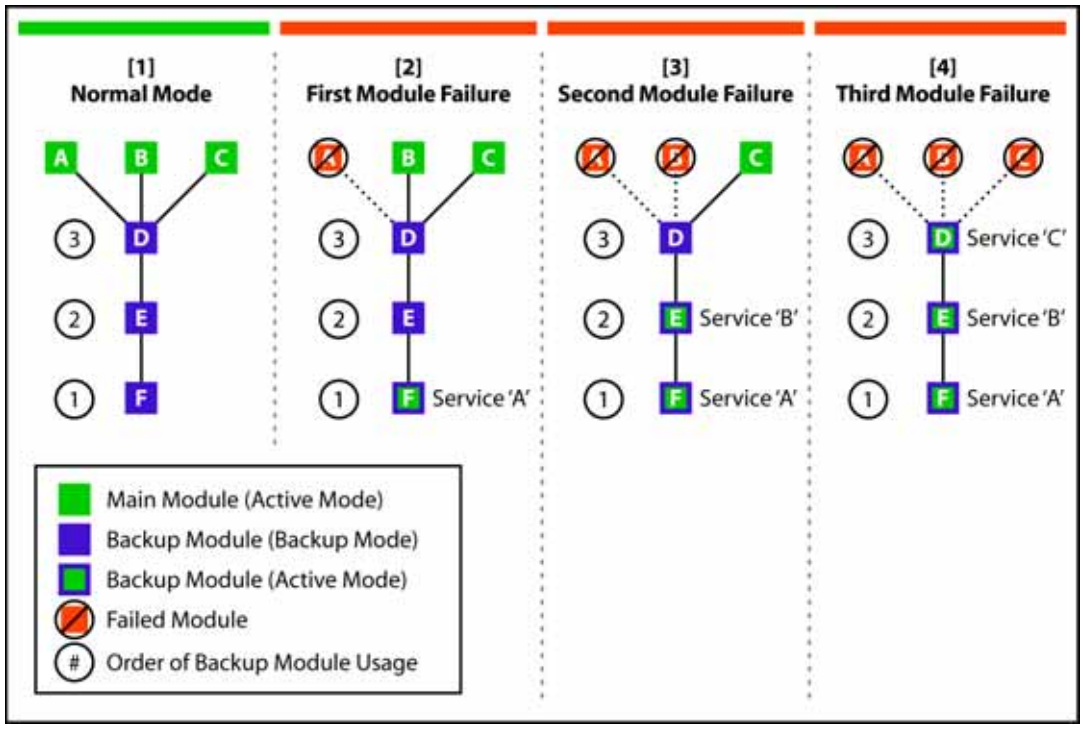


Figure 14-2 Many-to Many Redundancy Configuration

Figure 14-2 illustrates a 'Many-to-Many' redundancy relationships between NetVX modules made possible in release 6.6.0. This series of redundancy relationships is called a 'Backup Chain'.

Elements in Figure 14-2's Backup Chain are configured in the following order.

- Module F is configured as a 'Backup'.
- Module E is configured as 'Protected by (Module F)'.
- Module D is configured as 'Protected by (Module E)'.
- Modules A, B, and C are configured as 'Protected by (Module D)'.

The backup module, Module F, is used first when any other module within the chain fails.

The service on any subsequent module failure transfers to Module E. Services for additional failed modules continue to move up the Backup Chain.

[1] Normal Mode

Modules operate normally.

[2] First Module Failure

In the event 'Module A' fails, then 'Module F' acts as its backup. 'Module F' acts as backup first because it is the module at the very end of the string of backup modules.

[3] Second Module Failure

In the event 'Module B' fails, then 'Module E' acts as its backup.

[4] Third Module Failure

In the event 'Module C' fails, then 'Module D' acts as its backup.

Related Procedures

"How to Configure a Main Module" on page 432.
"How to Configure a Backup Module" on page 434
"Overview of Backup Module Compatibility" on page 431

14.4 Overview of Network Module Redundancy

Abstract: *This topic describes the types of network path protection offered by the NetVX Video Networking System.*

ATM Path Protection

The NetVX provides two types of ATM Path Protection.

- "ATM Path Protection: Using Redundant ATM Modules" on page 443.
- "ATM Path Protection: Using an External Optical Switch" on page 444.

IP Path Protection

"IP Path Protection: Using Redundant IP Modules" on page 445.

14.4.1 ATM Path Protection: Using Redundant ATM Modules

Abstract: *This topic describes an ATM path protection solution for ATM modules. This method of protection provides a backup path for ATM data in the event the primary path goes down.*

The NetVX provides an automated ATM module failover facility that can be triggered by either a Loss of Signal (LOS) or an Alarm Indication Signal (AIS). In the event of an LOS, or in the event an AIS is received, a NetVX configured in this manner fails over to its backup ATM module and the secondary network path becomes the primary path.

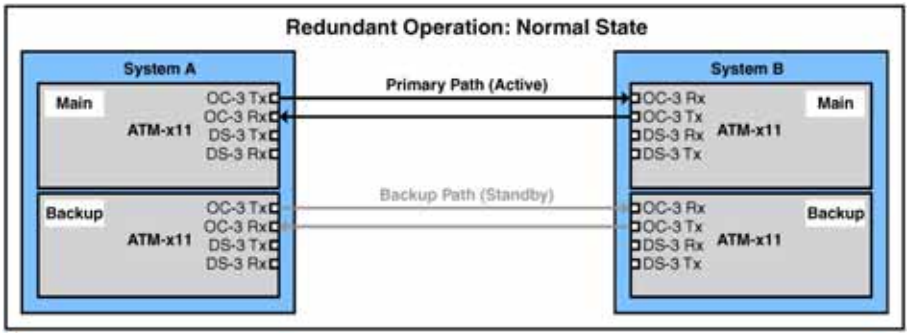


Figure 14-3 ATM Module with Redundant Backup — Normal State

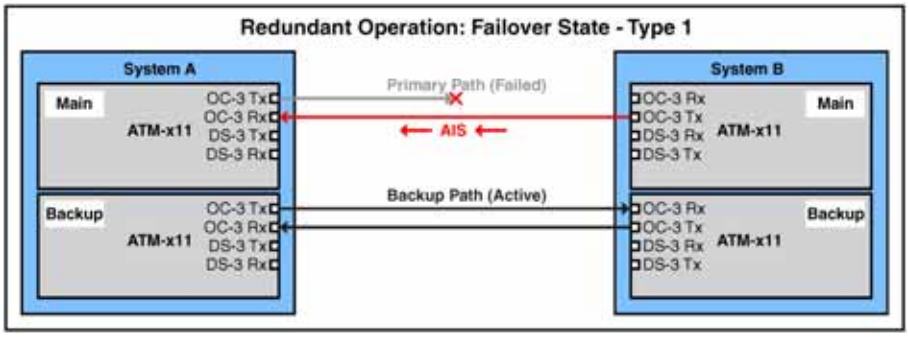


Figure 14-4 ATM Module with Redundant Backup — Failover State Following A Partial Fiber Break

The following example refers to the case for failover shown in Figure 14-4.

1. System A's Primary Path of ATM transmission to System B is cut off due to some event.
2. System B's Main ATM module declares and LOS and raises the Network Protection fault alarm.
3. System B's System Controller fails over the ATM service from the Main ATM module to the Backup ATM Module.
4. System B's Main ATM module begins transmitting the Alarm Indication Signal (AIS).
5. System A receives the AIS signal.

6 System A's Main ATM module raises the Network Protection fault alarm.

7 System A's System Controller fails over the ATM service from the Main ATM module to the Backup ATM Module and service is fully restored.

8 System A's Main ATM module also begins transmitting the Alarm Indication Signal (AIS).

Configuration is straightforward. Use the procedures listed below to configure the main and backup modules on each NetVX system.

Related Procedures

"How to Configure a Main Module" on page 432.
"How to Configure a Backup Module" on page 434
"Overview of Backup Module Compatibility" on page 431

14.4.2 ATM Path Protection: Using an External Optical Switch

Abstract: *This topic describes an ATM path protection solution for the ATM-S11 and ATM-L11 modules using an external optical switching device; the JDS Uniphase LightProtector 530.*

The NetVX provides ATM module-level failover and failback facilities similar to other modules – in the event a module fails, the system switches to the backup module. However an external device, such as the JDS Uniphase LightProtector 530 is required exchange signals between the two modules when the failover occurs.

Configuration is straightforward. Specify the backup ATM module using the procedure described in "How to Configure a Backup Module" on page 434.

Connect the modules to the LightProtector 530 as shown below. See the LightProtector manual for its configuration details.

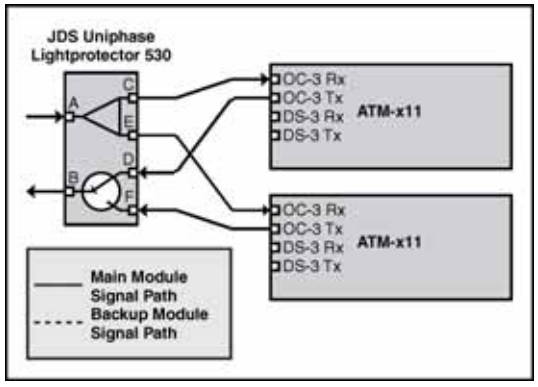


Figure 14-5 ATM-S11 and ATM-L11 Redundancy Wiring for the JDS Uniphase LightProtector 530

Related Procedures

"How to Configure a Main Module" on page 432.
"How to Configure a Backup Module" on page 434
"Overview of Backup Module Compatibility" on page 431

14.4.3 IP Path Protection: Using Redundant IP Modules

Abstract: *This topic describes an IP path protection solution for GBE modules. This method of protection provides a backup path for IP data in the event the primary path goes down.*

Figure 14-6 shows two systems connected to one another via Gigabit Ethernet over an IP network.

⚠ WARNING!

Warning: The 'IP Network' cloud shown in Figure 14-6 suggests intermediate equipment, such as (minimally) at least one IP switch. In such a configuration the switch would maintain LINK status on the un-impaired end of the connection.
Direct or 'back-to-back' connections between Ethernet ports on NetVX systems do not maintain LINK as would an IP switch. Therefore, redundancy would not trigger or operate as described in this section.

A secondary path between the two units' backup module serves as a backup path.

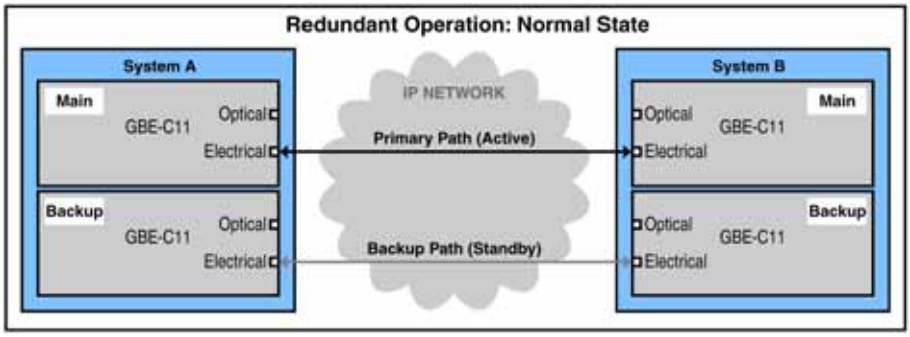


Figure 14-6 GBE-C11 Module with Redundant Backup — Normal State

Should the main module, on either system lose Ethernet LINK, then that module fails over to it's backup and the system on the opposite side of the network resumes communication with the bakup.

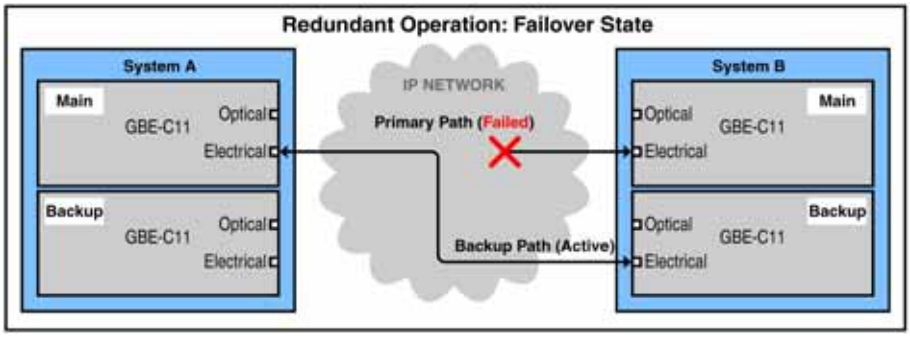


Figure 14-7 GBE-C11 Module with Redundant Backup — Failover State

Note: The GBE-C11's optical interfaces operate in the same manner as described above.

Related Procedures

"How to Configure a Main Module" on page 432.
"How to Configure a Backup Module" on page 434
"Overview of Backup Module Compatibility" on page 431

14.5 Overview of Cross Connection Redundancy

The NetVX provides support for redundant cross connections between application modules. Redundant cross connections share a common destination. In this configuration, one cross connection operates as the 'Active' source and the other cross connection operates as the 'Backup'.

A cross connection failover is possible as long as the 'Backup' cross connection has not experienced a raised alarm state lasting more than ten (10) seconds within the last sixty (60) seconds.

A cross connection failover is triggered when *the source of the 'Active' cross connection* experiences either a degrade or a fault alarm.

Following a failover, the 'Active' and 'Backup' roles of the original cross connections are reversed. The 'Backup' cross connection becomes the 'Active' cross connection and maintains the service. The formerly 'Active' cross connection becomes the 'Backup'.

Example

Figure 14-8 provides one example of how this feature may be implemented. In this example, an ATM VC and an ENC-S11 encoder are both connected to a transmit ATM VC (on another module). Programming originating at remote location is brought in via one ATM VC and transmitted out on a different ATM link. In the event the active ATM input link or VC is lost, the 'Local Feed' encoder can present a call letter station identification loop, a standby message, or other programming until the link providing the remote feed is restored.

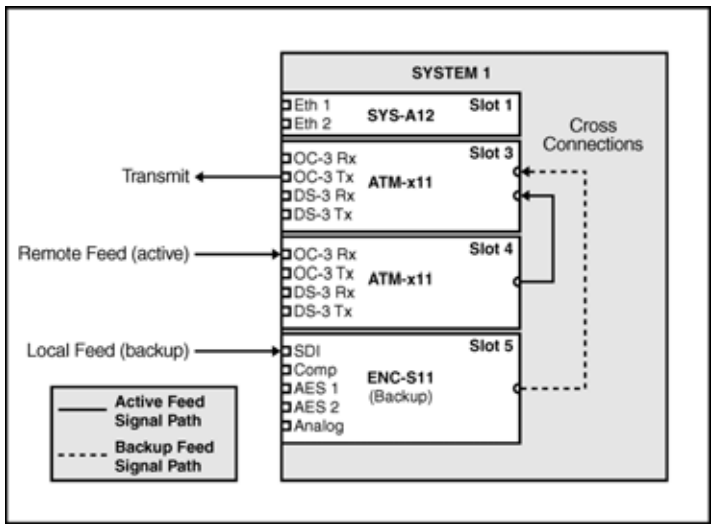


Figure 14-8 Example of a Redundant Cross Connection Application

Note: The ATM VCs shown in Figure 14-8 could possibly be located on a single ATM-M11/ATM-S11 module.

Release 7.5.0 introduced the concept of 'Roles' to cross connections. A given cross connection may be 'primary', 'revertive', or 'secondary'.

primary

A cross connection in this role carries the service when the cross connection source is operating as intended.

Alarming – The system issues a 'Service Degrade - Protection Failover Event' event when a service is switched between two primary cross connections. Note: This type of switch is distinct from a 'failover' which is described in the two cases below.

revertive

A cross connection in this role carries the service only when the source of the 'primary' cross connection has failed.

In the event that the 'primary' cross connection's source fails, the system transitions to this cross connection by making its state 'active' and the 'primary' cross connection's state 'inactive'.

A cross connection in this role automatically fails back to the 'primary' cross connection when the primary's source is restored and it's state again becomes 'active'.

Alarming – The system raises a 'Service Degrade - Protection Switch' during the entire period in which the 'Secondary' cross connection is active.

secondary

A cross connection in this role carries the service only when the source of the 'primary' cross connection has failed.

In the event that the 'primary' cross connection's source fails, the system transitions to this cross connection by making its State 'active' and the 'primary' cross connection's state 'inactive'.

Unlike the 'revertive' role (described above), a cross connection in this role does not automatically failback to the 'primary' cross connection when it's source is restored and it's state again becomes 'active', instead failback must be manually initiated.

Alarming – The system raises a 'Service Degrade - Protection Switch' during the entire period in which the 'Secondary' cross connection is active.

Set roles according to the desired type of failover behavior and alarming.

Cross Connection-Related Procedures

- "How to Create a Cross Connection" on page 146.
- "How to Configure a Backup Cross Connection" on page 147.
- "How to Modify a Cross Connection" on page 148.
- "How to Delete a Cross Connection" on page 149.
- "How to Create an ATM Virtual Channel" on page 136.

14.6 System Controller Redundancy Wiring and Configuration

Abstract: *Use this procedure to configure a system controller with a redundant backup.*

Note: (1) Telnet and any other 'state-dependent' TCP connections are closed when a system controller module fails over to its backup module. Following a failover, the Telnet session may be re-initialized using the same IP address.
(2) If using the SYS-A22, then reference I/Os must be provided to both the primary and the backup modules.
(3) Some leading-brand IP switches offer port security options that monitor the MAC address associated with an interface. In the event a MAC address associated with one interface appears on another interface, the second interface is disabled.
Unfortunately this behavior is exactly how redundant NetVX System Controller modules operate. Each module has a unique IP address, but both share a common MAC address. In the event the Primary System Controller fails, the Backup System Controller 'inherits' the Primary's MAC address.
Therefore, when a NetVX is equipped with redundant system controllers, the 'Secure MAC Address' feature on the IP switch must be disabled on ports connected to the Primary and Secondary System Controllers.

Prerequisites

Be sure that the following basic wiring configuration procedures have been performed.

Note: In the following steps, a DB-25 breakout cable is used with each SYS-A12, and an HD-15 breakout cable is used with each SYS-A22.

1. Plug a the appropriate breakout cable into each system controller.
2. Connect the DB-9 ends (each is labeled) of the breakout cable into their respective connectors on the NetVX's connector board. Be sure to connect all four DB-9 ends to the appropriate connectors.
   - Application module redundancy requires identical main and backup Module Types in each slot.
   - The DB-9 end labelled COM1 on the cable plugged into the System Controller in slot 1 should be connected to the 'SYS1 COM1' port on the NetVX.
   - The DB-9 end labelled COM2 on the cable plugged into the System Controller in slot 1 should be connected to the 'SYS1 COM2' port on the NetVX.
3. Repeat Step 2 above with the secondary System Controller.

Procedure

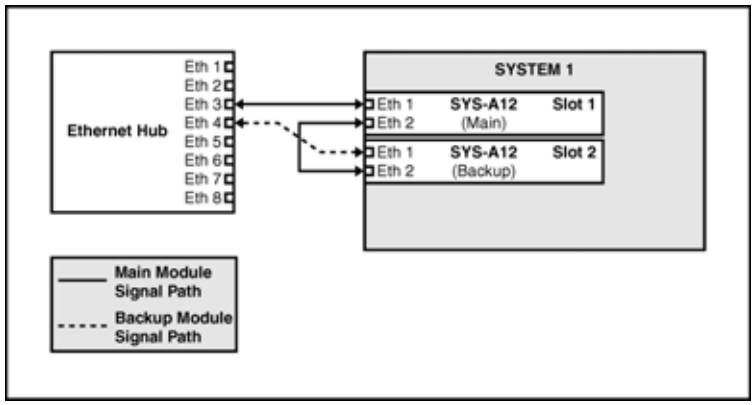


Figure 14-9 SYS-A12 Redundancy Wiring

4. Install the main SYS-A12 in slot 1, and the backup SYS-A12 in slot 2.
5. Use a standard CAT-5 Ethernet cable to connect each system controller's 'ETH 1' port to an IP switch or hub.
6. Use a standard CAT-5 Ethernet cable to connect the two 'ETH 2' ports to one another.
   When operating in redundancy mode, the backup system controller uses this cable to verify the state of the primary system controller in slot 1.

7 Use the craft port command cfg slot.s/ip/ifc.m ipaddr to configure the IP address on each module's primary interface. Replace the IP address in the example below with the IP addresses for your modules.

```
cfg slot.1/ip/ifc.1 ipaddr 10.40.80.100
cfg slot.2/ip/ifc.1 ipaddr 10.40.80.101
```

8 Use the craft port command cfg slot.s/ip/ifc.m ipmask to configure the IP subnet mask on each module's primary interface. Replace the IP subnet mask in the examples below with the IP subnet masks of your modules.

```
cfg slot.1/ip/ifc.1 ipmask 255.255.255.0
cfg slot.2/ip/ifc.1 ipmask 255.255.255.0
```

9 Use the craft port command util ip update to activate the above IP address changes.

Related Procedures

"How to Configure a Main Module" on page 432.
"How to Configure a Backup Module" on page 434
"Overview of Backup Module Compatibility" on page 431

14.7 Receive Interface Router Settings

Abstract: *Use this procedure to specify the router input and output ports the NetVX should use with the selected receive (input) interface.*

The NetVX receives signals from external equipment through input interfaces on its application modules. The ENC, TMX, and ATM modules all have receive interfaces. The following router control settings are common to these interfaces.

Router Level

Specifies the router level to associate with the signal feeding this module. A unique, numeric, router level is typically assigned to each type of signal. Follow the links at the bottom of this topic for examples for typical level assignments.

Note: Router levels also must be configured on the router itself. Check your router's documentation for specific instructions.

Router Input Port

Specifies the router (input) port receiving its signal directly from the signal source.

Router Output Port

Specifies the router (output) port connected directly to the NetVX application module's input interface.

Related Topics

- "Using an NxN Router with Encoder Module Receive Interfaces" on page 451.
- "Using an 8x1 Digital Router with Encoder Module Receive Interfaces" on page 454.
- "Using an 8x1 Analog Router with Encoder Module Receive Interfaces" on page 456.
- "Using a NxN Digital or Analog Router with Module Transmit Interfaces" on page 459.

14.8 Receive Interface Redundancy Wiring and Configurations

14.8.1 Using an NxN Router with Encoder Module Receive Interfaces

When using either an NxN digital, or an NxN analog router, each application module receives its signal from a unique router output port. The following diagram illustrates a 12x12 router configuration using encoders as receiving application modules. The same basic wiring is applicable to the ATM and TMX modules' receive interfaces as well.

In this configuration, when an application module fails, the signal feeding the failed module is re-directed to the module's designated backup.

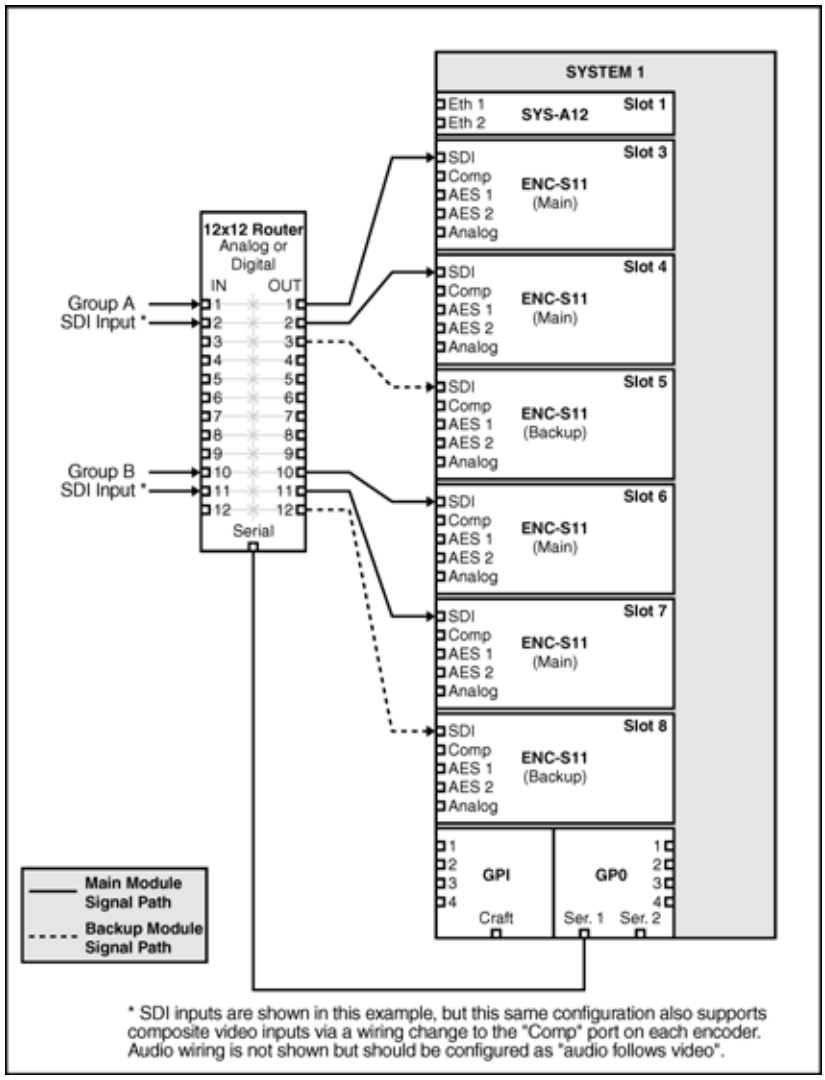


Figure 14-10 NxN Digital/Analog Receive Router Wiring

The router settings shown in Table 14-1 on page 452 support the configuration pictured in the figure above.

Table 14-1 NxN Digital/Analog Receive Router Settings

ENC-S11 Slot 3 – Primary Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	1	1
Audio 1	1	1	1
Audio 2	2	1	1

ENC-S11 Slot 4 – Primary Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	2	2
Audio 1	1	2	2
Audio 2	2	2	2

ENC-S11 Slot 5 – Backup Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	–	3
Audio 1	1	–	3
Audio 2	2	–	3

ENC-S11 Slot 6 – Main Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	10	10
Audio 1	1	10	10
Audio 2	2	10	10

ENC-S11 Slot 7 – Main Module

ENC-S11 Slot 3 – Primary Module			
Signal	**Level**	**Input Port**	**Output Port**
Signal	**Level**	**Input Port**	**Output Port**
Video	0	11	11
Audio 1	1	11	11
Audio 2	2	11	11

ENC-S11 Slot 8 – Backup Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	–	12
Audio 1	1	–	12
Audio 2	2	–	12

14.8.2 Using an 8x1 Digital Router with Encoder Module Receive Interfaces

When using an Nx1 digital router, duplicate digital signals are required for each module. One signal goes directly to the module's receive interface. The other signal goes to the input on the digital router.

The following diagram illustrates an 8x1 digital router configuration using encoders as receiving application modules. The same basic wiring is applicable to the ATM and TMX modules' receive interfaces as well.

In this configuration, when an application module fails, the signal feeding the router input port associated with the failed module is re-directed to the backup module connected to the router's output.

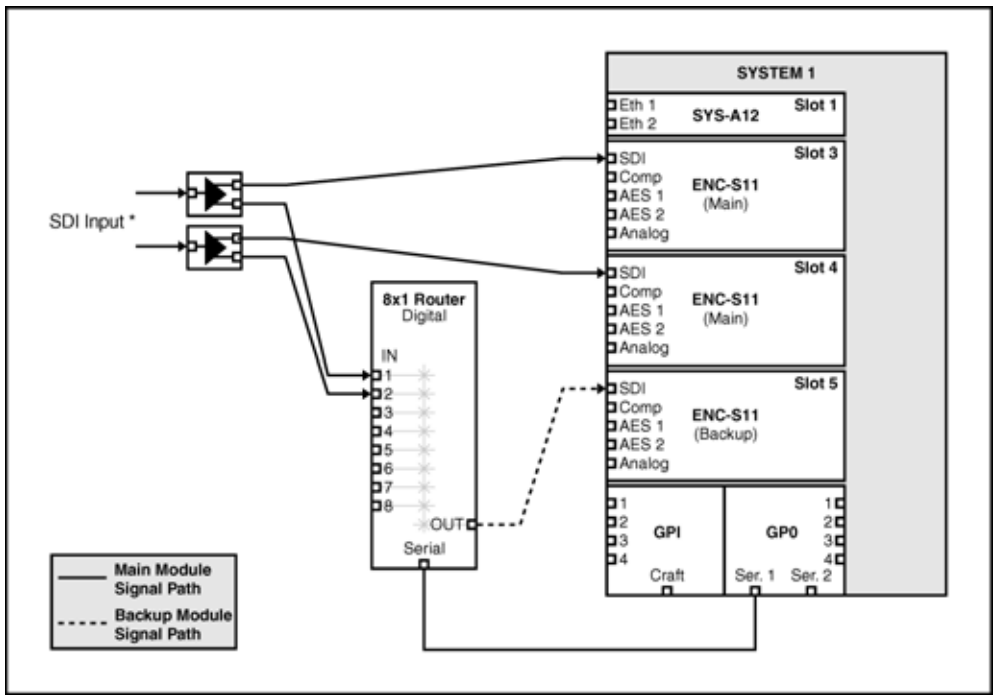


Figure 14-11 8x1 Digital Router Wiring Configuration

The router settings shown in Table 14-2 on page 455 support the configuration pictured above.

Table 14-2 8x1 Digital Receive Router Settings

ENC-S11 Slot 3 – Main Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	1	–
Audio 1	1	1	–
Audio 2	2	1	–

ENC-S11 Slot 4 – Main Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	2	–
Audio 1	1	2	–
Audio 2	2	2	–

ENC-S11 Slot 5 – Backup Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	–	1
Audio 1	1	–	1
Audio 2	2	–	1

14.8.3 Using an 8x1 Analog Router with Encoder Module Receive Interfaces

When using an Nx1 analog router, each module receive interface gets its signal from a unique router input loop through. The following diagram illustrates a 4x1 analog router configuration using encoders as receiving application modules.

In this configuration, when an application module fails, the signal feeding the router input port associated with the failed module is re-directed to the backup module connected to the router's output.

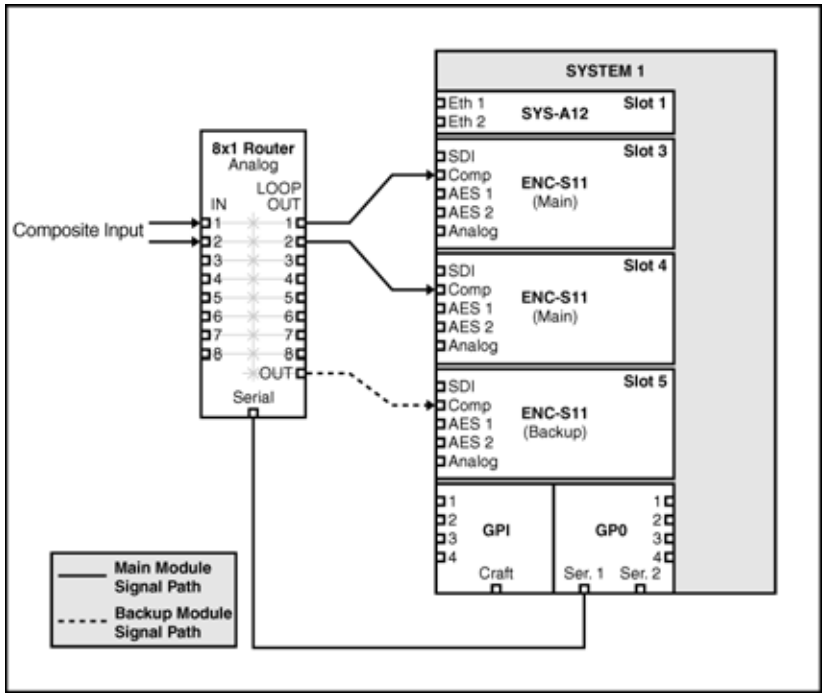


Figure 14-12 8x1 Analog Router Wiring Configuration

The router settings shown in Table 14-3 on page 457 support the configuration pictured above.

Table 14-3 4x1 Analog Receive Router Settings

ENC-S11 Slot 3 – Main Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	1	1
Audio 1	1	1	1
Audio 2	2	1	1

ENC-S11 Slot 4 – Main Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	2	2
Audio 1	1	2	2
Audio 2	2	2	2

ENC-S11 Slot 5 – Main Module			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	–	1
Audio 1	1	–	1
Audio 2	2	–	1

14.9 Transmit Interface Router Settings

Abstract: *Use this procedure to specify the router input and output ports the NetVX should use for the selected transmit (output) interface.*

The NetVX transmits it signals through its application module's 'Transmit Interfaces'. The DEC, TMX, and ATM modules all have transmit interfaces. The following router control settings are common to these interfaces.

Router Level

Specifies the router level to associate with the signal leaving this module. A unique, numeric, router level is typically assigned to each type of signal. See the example at the end of this topic for typical level assignments.

Note: Router levels also need to be set on the router itself! Check your router's documentation for specific instructions.

Router Input Port

Specifies the router (input) port receiving its signal directly from the NetVX application module's transmit interface.

Router Output Port

Specifies the router (output) port responsible for providing the NetVX's signal to other equipment.

Related Topics

"Using a NxN Digital or Analog Router with Module Transmit Interfaces" on page 459

14.10 Transmit Interface Redundancy Wiring and Configurations

14.10.1 Using a NxN Digital or Analog Router with Module Transmit Interfaces

When using either an NxN digital, or an NxN analog router, each application module transmits its signal to a unique router input port. The following diagram illustrates a 12x12 router configuration using decoders as transmitting application modules. The same basic wiring is applicable to the ATM and TMX modules' transmit interfaces as well.

In this configuration, when an application module fails, the router draws the signal feeding the associated output port from the failed module's designated backup.

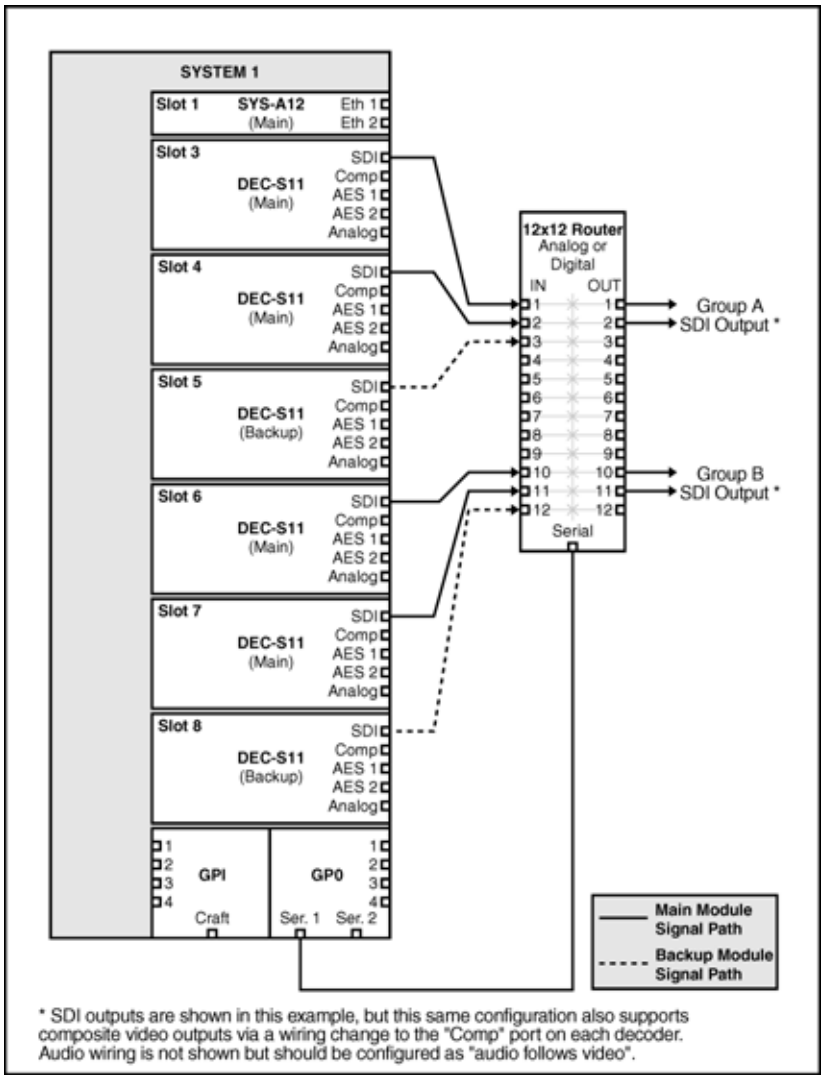


Figure 14-13 NxN Digital or Analog Router Wiring Configuration

The router settings shown in Table 14-4 on page 460 support the configuration pictured above.

Table 14-4 NxN Transmit Router Settings

DEC-S11 Slot 3 – Main Module (Group A)			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	1	1
Audio 1	1	1	1
Audio 2	2	1	1

DEC-S11 Slot 4 – Main Module (Group A)			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	2	2
Audio 1	1	2	2
Audio 2	2	2	2

DEC-S11 Slot 5 – Backup Module (Group A)			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	3	–
Audio 1	1	3	–
Audio 2	2	3	–

DEC-S11 Slot 6 – Main Module (Group B)			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	10	10
Audio 1	1	10	10
Audio 2	2	10	10

DEC-S11 Slot 7 – Main Module (Group B)			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	11	11
Audio 1	1	11	11
Audio 2	2	11	11

DEC-S11 Slot 8 – Backup Module (Group B)			
Signal	**Level**	**Input Port**	**Output Port**
Video	0	12	–
Audio 1	1	12	–
Audio 2	2	12	–

Chapter 15: NetVX Utilities 15

15.1 Utilities Branch

Click a tab on the right side of the screen to view a list of configurations or the list of firmware currently on the system. With any tab selected, press F1 for help on items in that group

Note: Double click this branch, or in any cell in any table on the right side of the screen, to open the Utilities dialog.

Related Topic

"Utility Dialogs" on page 463

15.1.1 Config > Utilities > Configuration Tab

This tab lists the index number and tag of all saved system configurations.

Related Dialogs

"Config > Utilities > Configuration Dialog" on page 464

Related Procedures

- "How to Save a NetVX System Configuration" on page 155.
- "How to Load a NetVX System Configuration" on page 157.
- "How to Delete a NetVX System Configuration" on page 157.

15.1.2 Config > Utilities > Firmware Tab

This tab lists the 'Name' and 'Status' of all firmware saved on the system. The status column may display any of the following.

Previous Indicates the last firmware that was active on the system.

Current, Booted Indicates the firmware version that is currently loaded, booted, and running on the system.

Related Dialog

"Config > Utilities > Firmware Dialog" on page 465

Related Procedures

- "Appendix B: NetVX Firmware Upgrade Procedure" on page 631.
- "How to Change the Current Active Firmware" on page 638.

15.1.3 Config > Utilities > Profile Tab

This tab lists the index number, tag name, and branch of all profiles saved in the system.

Related Dialog

- "Config > Utilities > Profile Dialog" on page 467

Related Procedures

- "How to Save a Profile from a Branch" on page 158.
- "How to List All Encoder and Decoder Profiles" on page 158
- "How to Load a Profile into a Branch" on page 158.
- "How to Delete a Profile" on page 159.

15.2 Utility Dialogs

Abstract: *This section describes Vidiem™s Utility Dialogs.*

Right-click on the 'Modules' branch in the navigation tree to access Vidiem™'s Utility Dialogs.

Related Topic

"Utilities Branch" on page 461

15.2.1 Config > Utilities > Clear Status Dialog

Clear System and Status Counters (checkbox)
Check this box to enable either the 'Clear System…' or the 'Clear Module…' functions below.

Clear System and Status Counters (radio button)
Clears all system status counters and indicators when the clear button is pressed.

Clear Module and Status Counters (radio button)
Clears all module status counters and indicators when the clear button is pressed.

Clear Alarm History (checkbox)
Clears the NetVX's alarm history when the clear button is pressed.

Clear Alarms Log (checkbox)
Clears the NetVX's alarm log when the clear button is pressed.

Clear (button)
Immediately clears items selected in this dialog.

Close
Omits any changes not sent to the system by pressing the 'Clear' button, and closes this dialog.

Related Procedure

"How to Clear Module Status and Counter Values" on page 160

15.2.2 Config > Utilities > Configuration Dialog

Abstract: *The NetVX can store all of its settings, except for those associated with IP communications, in up to 99 distinct 'Configurations'. Use this dialog to name, save, load, and delete Configurations.*

Use the appropriate option to manage system Configurations.

(Radio Buttons)

Save Configuration Choose this option to save a Configuration. This option enables either the 'Use New Tag' or the 'Preserve Old Tag' options described below.

Note: It's always best to apply a name to a configuration. Seeing a name next to a configuration number can help you, or others working on the same system, to avoid overwriting the new configuration. A configuration's name can also help to distinguish its function from that of others in the list.

Load Configuration Choose this option to load (or 'make active') a Configuration that has already been saved on the NetVX.

Delete Configuration Choose this option to delete a Configuration saved on the NetVX.

Configuration Index

This control lists Configuration numbers and their associated tags. Tags are optional and may not appear beside each 'Saved Configuration' entry.

Use New Tag (option)

When saving a configuration, select a configuration 'Index' number, then choose this option, and enter name in the space provided. Press the 'Configure' button (below) to apply the name entered to the selected configuration number.

Preserve Old Tag (option)

When saving a configuration, select a configuration 'Index' number, then choose this option and press the 'Configure' button (below) to re-save the configuration with its original name.

Configure (button)

This button invokes the configure command to load, save, or delete the selected configuration.

Close

Omits any changes not sent to the system by pressing the 'Configure' button and closes this dialog.

Related Procedures

- "How to Save a NetVX System Configuration" on page 155.
- "How to Load a NetVX System Configuration" on page 157.
- "How to Delete a NetVX System Configuration" on page 157.

15.2.3 Config > Utilities > Firmware Dialog

Abstract: *Use the controls in this dialog to configure NetVX to use new firmware.*

Current Version

Indicates the version of firmware currently running on the system.

Version to Bind

Indicates the version of firmware that you wish to make the current version.

Reset System After Successful Bind

Check this box to cause the system to reset after it binds to new firmware specified in the 'Version to Bind' list box (above).

Close

Omits any changes not sent to the system by pressing the 'Bind' button and closes this dialog.

Related Procedures

- "Appendix B: NetVX Firmware Upgrade Procedure" on page 631.
- "How to Change the Current Active Firmware" on page 638.

15.2.4 Config > Utilities > Key Dialog

Abstract: *Use the controls in this dialog to manage the NetVX's feature keys. Keys enable or disable premium features. Each key is applicable to a specific NetVX chassis or module based on serial number. The* "System and Module Types and Keyed Features" on page 472 *describes the various models and options that are available.*

System Chassis (option)

Choose this option if the key string is applicable to the system chassis.

Individual Module (option)

Choose this option if the key string is applicable to an individual module.

Key String

Use this control to enter a key string. The key should be in xxx-xxx-xxx-x format.

Serial Number (read only)

Identifies the serial number of either the System Chassis (if selected) or of the Individual Module highlighted in the list.

Apply Key (button)

Applies the specified key string to the selected item.

Related Procedures

- "How to Set the System Chassis Key" on page 169
- "How to Set a Module Key" on page 169
- "System and Module Types and Keyed Features" on page 472

15.2.5 Config > Utilities > Profile Dialog

Abstract: *Use the controls in this dialog to manage NetVX Profiles. A Profile is a subset of a Configuration. A Profile may consist of all the settings for an encoder or for a decoder. Vidiem™ allows you to copy Profiles from one module to another using the controls in this dialog.*

Save/Load/Delete Profiles

Use the appropriate option to manage system configurations.

Save Profile from Branch Choose this option to save a profile. This option enables either the 'Use New Tag' or the 'Preserve Old Tag' options described below.

Load Profile into Branch Choose this option to load a profile, already saved on the NetVX, into another module.

Delete Profile Choose this option to delete a profile saved on the NetVX.

Profile Index

This control lists Profile numbers and their associated tags. Tags are optional and may not appear beside each Profile entry.

Use New Tag (option)

When saving a Profile, select an 'Index' number, then choose this option, and enter name in the space provided. Press the 'Configure' button (below) to apply the name entered to the selected Profile number.

Preserve Old Tag (option)

When saving a Profile, select a Profile 'Index' number, then choose this option and press the 'Configure' button (below) to re-save the Profile with its original name.

Configure (button)

This button invokes the configure command to load, save, or delete the selected Profile.

Close

Omits any changes not sent to the system by pressing the 'Configure' button and closes this dialog.

Related Procedures

- "How to Save a Profile from a Branch" on page 158.
- "How to List All Encoder and Decoder Profiles" on page 158
- "How to Load a Profile into a Branch" on page 158.
- "How to Load a Profile into a Branch" on page 158.
- "How to Delete a Profile" on page 159.

15.2.6 Config > Utilities > Protection Modules Dialog

Abstract: *This dialog provides controls for operations related to module-level protection.*

Failover from Main Module to Backup

Use this selection to manually switch service from a main module to its backup.

Restore Service to Main Module

Use this selection to return a service to the main module on which it was being processed prior to failing over to a backup module.

Main Module

Use this drop down to select the main module (described above) from which the service will failover, or to which the service will be restored.

Transfer

Press this button to transfer service after making the various selections listed above.

Close

Omits any changes not sent to the system by pressing the 'Transfer' button and closes this dialog.

Related Procedures

"Config > Module Properties Dialog" on page 238
"General Module Redundancy Procedures" on page 431
"How to Configure a Main Module" on page 432
"How to Configure a Backup Module" on page 434

15.2.7 Config > Utilities > Protection Services Dialog

Abstract: *This dialog provides controls for operations related to service-level protection; also known s redundant cross connections.*

Active Cross Connect

Use this drop down to select a cross connection that has a backup cross connection associated with it. The other read-only fields in this dialog display information about the backup.

Protected by (read only)

Identifies the backup cross connection.

Active

Indicates the active cross connection.

Backup

Indicates the backup cross connection.

Transfer

Press this button to transfer service from the selected main cross connection to a backup.

Close

Closes this dialog.

Cross Connection-Related Topics

- "How to Create a Cross Connection" on page 146
- "How to Configure a Backup Cross Connection" on page 147
- "How to Modify a Cross Connection" on page 148
- "How to Delete a Cross Connection" on page 149

ATM Path Protection Topics

"General Module Redundancy Procedures" on page 431

- "ATM Path Protection: Using Redundant ATM Modules" on page 443
- "ATM Path Protection: Using an External Optical Switch" on page 444

IP Path Protection

"IP Path Protection: Using Redundant IP Modules" on page 445

15.2.8 Config > Utilities > Reset Dialog

Abstract: *This dialog provides system and module reset controls.*

Entire System

Choose this option and press the reset button to 'Reset' the entire NetVX system.

Individual Modules

Choose this option, highlight one or more modules, and press the 'Reset' button to immediately reset selected modules. Use 'Ctrl+Click' to select more than one module.

Reset

Resets the selected items.

Close

Omits any changes not sent to the system by pressing the 'Reset' button and closes this dialog.

Related Dialog

- "How to Reset the System" on page 171
- "How to Reset Individual Modules" on page 171

15.2.9 Config > Utilities > Set Time Dialog

Abstract: *This dialog provides controls for setting the system's date and time.*

Use Current Time

Vidiem™ gathers your PC's time setting when you select 'Utilities + (right click) Properties'. Choose this option and press 'Set Time' to send this time value to the NetVX.

Select UTC Date and Time

Choose this option to specify current UTC time. The US Naval Observatory Master Clock provides the current time at the following URL:

```
http://tycho.usno.navy.mil/cgi-bin/timer.pl
```

Set Time

Use this button to set the system date and time to the values specified in 'Select UTC Date and Time'.

Close

Omits any changes not sent to the system by pressing the 'Set Time' button and closes this dialog.

Related Procedures

"How to Change the System Date and Time" on page 172

15.3 System and Module Types and Keyed Features

Abstract: *This sections describes the NetVX's 'Feature Keys' which control the system's premium features.*

The following pages provide tables identifying the features associated with each type of chassis and module.

- Section 15.3.1, "SYS-200 Chassis Types and Features" on page 472 (below).
- Section 15.3.3, "SYS-350 Chassis Types and Features" on page 473.
- Section 15.3.4, "SYS-1700 Chassis Types and Features" on page 474.
- Section 15.3.5, "System Controller Module Types and Features" on page 474.
- Section 15.3.6, "ATM-M11 ATM-S11 and ATM-L11 Module Types and Features" on page 474.
- Section 15.3.8, "ENC-S11 Module Types and Features" on page 476.
- Section 15.3.9, "ENC-S21 Module Types and Features" on page 477.
- Section 15.3.10, "ENC-H11 Module Types and Features" on page 478.
- Section 15.3.13, "AUD-D14 Module Types and Features" on page 480.
- Section 15.3.14, "DEC Module Types and Features" on page 480.
- Section 15.3.15, "TMX Module Types and Features" on page 481.
- Section 15.3.16, "GBE Module Types and Features" on page 482.

Note: Key assignment controls are described in the "Config > Utilities > Key Dialog" on page 466.

15.3.1 SYS-200 Chassis Types and Features

SYS-200-AC This system chassis provides slots pre-populated with application modules and uses AC power. The SYS-200 occupies 1 RU of vertical rack space.

Table 15-1 SYS-200 Chassis Type Definitions

Features	SYS-200 Chassis Types	
	SYS-200-STD	SYS-200-MUX
Internal TMX-M12-TNL2 Module	●	❍
Internal TMX-M12-MUX Module	❍	●
IP on ATM (Optional keyed feature)	SYS-200-STD-IA	SYS-200-STD-IA
Video on IP (Optional keyed feature)	SYS-200-STD-VIP	SYS-200-STD-VIP

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.2 SYS-300 Chassis Types and Features

SYS-300-AC This system chassis provides 3 slots for application modules and uses AC power. The SYS-300 occupies 1 RU of vertical rack space.

Table 15-2 SYS-300 Chassis Type Definitions

Features	SYS-300 Chassis Types				
	SYS-300-AC	SYS-300-AC-STD	SYS-300-AC-IA	SYS-300-AC-IA-VI	SYS-300-AC-VI
IP on ATM	●	❍	●	●	❍
Video on IP	●●❍	❍	❍	●	●

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.3 SYS-350 Chassis Types and Features

SYS-350-AC This system chassis provides 3 slots for application modules and uses AC power. The SYS-350 occupies 1 RU of vertical rack space.

SYS-350-DC This system chassis provides 3 slots for application modules and uses DC power. The SYS-350 occupies 1 RU of vertical rack space.

Table 15-3 SYS-350 Chassis Type Definitions

Features	SYS-350 Chassis Types						
	SYS-350-AC	SYS-350-AC-STD	SYS-350-AC-IA	SYS-350-AC-IA-VI	SYS-350-AC-VI	SYS-350-AC-MHE	SYS-350-AC-MHES
IP on ATM	●	❍	●	●	❍	❍	❍
Video on IP*	●	❍	❍	●	●	❍	❍
MH Encapsulation	❍	❍	❍	❍	❍	●	❍
MH Encapsulation and Signalling	❍	❍	❍	❍	❍	❍	●

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.4 SYS-1700 Chassis Types and Features

VR-1700-AC This system chassis provides 17 slots for application modules and uses AC power. The VR-1700 occupies 5 RU of vertical rack space.

VR-1700-DC This system chassis provides 17 slots for application modules and uses DC power. The VR-1700 occupies 5 RU of vertical rack space.

Table 15-4 SYS-1700/VR-1700 Chassis Type Definitions

Features	SYS-1700 Chassis Types						
	SYS-1700-AC, SYS-1700-DC	SYS-1700-AC-STD, SYS-1700-DC-STD	SYS-1700-AC-IA, SYS-1700-DC-IA	SYS-1700-AC-IA-VI, SYS-1700-DC-IA-VI	SYS-1700-AC-VI, SYS-1700-DC-VI	SYS-1700-AC-MHE, SYS-1700-DC-MHE	SYS-1700-AC-MHES, SYS-1700-DC-MHES
IP on ATM	●	❍	●	●	❍	❍	❍
Video on IP	●	❍	❍	●	●	❍	❍
MH Encapsulation	❍	❍	❍	❍	❍	●	●
MH Encapsulation and Signalling	❍	❍	❍	❍	❍	●	●

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.5 System Controller Module Types and Features

The System Controller module does not have any premium features in NetVX firmware release 6.7 and below.

15.3.6 ATM-M11 ATM-S11 and ATM-L11 Module Types and Features

Table 15-5 ATM-M11, ATM-S11, and ATM-L11 Module Type Definitions

Features	ATM-M11, ATM-S11, ATM-L11, and ATM-X11 Module Types			
	1	1A1	2	2A1
MPEG-2 encapsulation in AAL-5	●	●	●	●
MPEG-2 encapsulation in AAL-1	❍	●	❍	●
IP encapsulation in AAL-5	●	●	●	●
Traffic Class Prioritization	●	●	●	●
Number of concurrently active interfaces per card	1	1	2	2

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.7 ATM-X11 Module Types and Features

Note: Software distinguishes between only the following ATM-X11 module types: ATM-X11-1, ATM-X11-1A1, ATM-X11-2, ATM-X11-2A1. The types below indicate the ordering code for each ATM-X11 and SFP combination.

Table 15-6 ATM-X11 Module Type Definitions

Features	ATM-X11 Module Types																	
	No SFP		Single-Mode SFP				Single-Mode Long-Reach SFP				Multi-Mode SFP				STM-1e SFP			
	ATM-X11-1	ATM-X11-1A1	ATM-X11-S1	ATM-X11-S1A1	ATM-X11-S2	ATM-X11-S2A1	ATM-X11-L1	ATM-X11-L1A1	ATM-X11-L2	ATM-X11-L2A1	ATM-X11-M1	ATM-X11-M1A1	ATM-X11-M2	ATM-X11-M2A1	ATM-X11-E1	ATM-X11-E1A1	ATM-X11-E2	ATM-X11-E2A1
MPEG-2 Encapsulation in AAL-5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
MPEG-2 Encapsulation in AAL-1	❍	●	❍	●	❍	●	❍	●	❍	●	❍	●	❍	●	❍	●	❍	●
IP Encapsulation in AAL-5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Traffic Class Prioritization	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
One (1) Active Interface Per Card	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Two (2) Active Interfaces Per Card	❍	❍	❍	❍	●	●	❍	❍	●	●	❍	❍	●	●	❍	❍	●	●
Single-Mode Intermediate-Reach SFP Module	❍	❍	●	●	●	●	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Single-Mode Long-Reach SFP Module	❍	❍	❍	❍	❍	❍	●	●	●	●	❍	❍	❍	❍	❍	❍	❍	❍
Multi-Mode SFP Module	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	●	●	●	●	❍	❍	❍	❍
STM-1e SFP	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	●	●	●	●

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.8 ENC-S11 Module Types and Features

Two tables are provided in this section; one for each series of encoder.

Standard Definition Encoders

- Table 15-7, "ENC-S11 Module Type Definitions" on page 476.
- Table 15-8, "ENC-S21 Module Type Definitions" on page 477.

High-Definition Encoders

- Table 15.3.14, "DEC Module Types and Features" on page 480.

Table 15-7 ENC-S11 Module Type Definitions

Features	ENC-S11 Module Types										
Feature Key Suffix	ENC-S11-UTIL-M	ENC-S11-STD-M	ENC-S11-STD-MC	ENC-S11-STD-D	ENC-S11-STD-DC	ENC-S11-PRO-M	ENC-S11-PRO-D	ENC-S11-PRO-DM	ENC-S11-PRO-MC	ENC-S11-PRO-DC	ENC-S11-PRO-DMC
4:2:0 MPEG-2 Video Encoding (MP@ML)	●	●	●	●	●	●	●	●	●	●	●
4:2:2 Professional Profile with Extended Window	❍	❍	❍	❍	❍	●	●	●	●	●	●
Analog Video and Balanced Audio Interfaces	●	●	●	●	●	●	●	●	●	●	●
MPEG Layer 2 Audio (Musicam)	●	●	●	❍	❍	●	❍	●	●	❍	●
Dolby AC-3 2.0 Audio	❍	❍	❍	●	●	❍	●	●	❍	●	●
One Stereo Pair of Audio	●	●	●	●	●	●	●	●	●	●	●
Two Stereo Pairs of Audio	❍	●	●	●	●	●	●	●	●	●	●
SDI Video and AES Audio Interfaces	❍	●	●	●	●	●	●	●	●	●	●
Fixed-Key Scrambling	❍	❍	●	❍	●	❍	❍	❍	●	●	●
SMPTE 302M Audio Encapsulation	❍	❍	❍	❍	❍	●	●	●	●	●	●
VBI Extraction of Captions or Teletext, VBI Sampling, and Pass-Through Services	❍	●	●	●	●	●	●	●	❍	●	●
ATSC Features	❍	❍	❍	●	●	❍	●	●	❍	●	●
DVB Features	❍	●	●	❍	❍	●	❍	●	●	❍	●

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.9 ENC-S21 Module Types and Features

Table 15-8 ENC-S21 Module Type Definitions

Features	ENC-S21 Module Types		
	ENC-S21-STD-M	ENC-S21-STD-D	ENC-S21-STD-DM
MPEG-2 Video Encoding	●	●	●
Analog Video and Balanced Audio Interfaces	●	●	●
MPEG Layer 2 Audio (Musicam)	●	❍	●
Dolby AC-3 2.0 Audio	❍	●	●
One Stereo Pair of Audio	●	●	●
Two Stereo Pairs of Audio	●	●	●
SDI Video and AES Audio Interfaces	●	●	●
VBI Extraction of Captions or Teletext, VBI Sampling, and Pass-Through Services	●	●	●
ATSC Features	❍	●	●
DVB Features	●	❍	●

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.10 ENC-H11 Module Types and Features

Table 15-9 ENC-H11 Module Type Definitions

Features	ENC-H11 Module Types									
	ENC-H11-STD-M	ENC-H11-STD-D	ENC-H11-DVBT	ENC-H11-ATSC	ENC-H11-PRO-M	ENC-H11-PRO-D	ENC-H11-PRO-DM	ENC-H11-PRO-MC	ENC-H11-PRO-DC	ENC-H11-PRO-DMC
4:2:0 MPEG-2 Video Encoding (MP@ML)	●	●	●	●	●	●	●	●	●	●
4:2:2 Professional Profile with Extended Window	❍	❍	❍	❍	●	●	●	●	●	●
MPEG Layer 2 Audio (Musicam)	●	❍	●	❍	●	❍	●	●	❍	●
Dolby AC-3 2.0 Audio	❍	●	❍	●	❍	●	●	❍	●	●
Two Stereo Pair of Audio	●	●	●	●	●	●	●	●	●	●
SDI Video and AES Audio Interfaces	●	●	●	●	●	●	●	●	●	●
Conditional Access (BISS)	❍	❍	❍	❍	❍	❍	❍	●	●	●
SMPTE 302M Audio Encapsulation	❍	❍	❍	❍	●	●	●	●	●	●
VANC Extraction of Captions	●	●	●	●	●	●	●	●	●	●
Vertical Ancillary Data Support	❍	❍	❍	❍	●	●	●	●	●	●
ATSC Features	❍	❍	❍	●	❍	●	●	❍	●	●
DVB Features	❍	❍	●	❍	●	❍	●	●	❍	●

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.11 ENC-A11 Module Types and Features

Table 15-10 ENC-A11 Module Type Definitions

Features	ENC-A11 Module Type
	ENC-A11-SD-BL
MPEG-4 H.264 Video Encoding Level 1, 1.2, 1.3 (Base-Line)	●
MPEG-4 AAC-LC Audio (Low Complexity) — Two Pairs	●
MPEG-4 HE-AAC Audio (High Efficiency) — Two Pairs	●
VBI Extraction of Captions or Teletext, VBI Sampling, and Pass-Through Services	●

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.12 ENC-A21 Module Types and Features

Table 15-11 ENC-A21 Module Type Definitions

Features	ENC-A21 Module Types										
	ENC-A21-SD ENC-A21-HD	ENC-A21-SD-M ENC-A21-HD-M	ENC-A21-SD-D ENC-A21-HD-D	ENC-A21-SD-P ENC-A21-HD-P	ENC-A21-SD-MP ENC-A21-HD-MP	ENC-A21-SD-DP ENC-A21-HD-DP	ENC-A21-SD-MBL	ENC-A21-SD-MC ENC-A21-HD-MC	ENC-A21-SD-DC ENC-A21-HD-DC	ENC-A21-SD-DM ENC-A21-HD-DM	ENC-A21-SD-DMC ENC-A21-HD-DMC
MPEG-4 H.264 Video Encoding Level 1, 1.2, 1.3 (Base-Line)	●	●	●	●	●	●	●	●	●	●	●
MPEG-4 Part 10/H.264 Video Encoding Level 3 (SD), Level 4.1 (HD)	●	●	●	●	●	●	❍	●	●	●	●
MPEG Layer 2 Audio (Musicam) — Three Pairs	❍	●	❍	❍	●	❍	❍	●	❍	●	●
Dolby AC-3 2.0 Audio — Three Pairs	❍	❍	●	❍	❍	●	❍	❍	●	●	●
MPEG-4 AAC-LC Audio 2.0 (Low Complexity) — Two Pairs	●	●	●	●	●	●	●	●	●	●	●
MPEG-4 HE-AAC Audio 2.0 (High Efficiency) — Two Pairs	●	●	●	●	●	●	●	●	●	●	●
MPEG-4 AAC-LC 5.1	●	●	●	●	●	●	●	●	●	●	●
MPEG-4 HE-AAC 5.1	●	●	●	●	●	●	●	●	●	●	●
Fixed-Key Scrambling (BISS-1 and E)	❍	❍	❍	❍	❍	❍	❍	●	●	❍	●
SMPTE 302M Audio Encapsulation (Rate Permitting)	●	●	●	●	●	●	❍	●	●	●	●
VBI Extraction of SD Captions	*●	*●	*●	*●	*●	*●	*●	*●	*●	*●	*●
VANC Extraction of Captions	**●	**●	**●	**●	**●	**●	❍	**●	**●	**●	**●
Vertical Ancillary Data Support	**●	**●	**●	**●	**●	**●	❍	**●	**●	**●	**●
PIP Low-Resolution Secondary Stream	❍	❍	❍	●	●	●	❍	❍	❍	❍	❍

Legend	
Supported Feature on All Models	●
Supported Feature on SD Models Only	*●
Supported Feature on HD Models Only	**●
Unsupported Feature	❍

15.3.13 AUD-D14 Module Types and Features

Table 15-12 AUD-D14 Module Type Definitions

Features	AUD-D14 Module Types			
	AUD-D14-DEC	AUD-D14-ENC-D	AUD-D14-ENC-D	AUD-D14-ENC-DM
Four Stereo Pair of AES Digital Audio Interfaces	❍	●	●	●
MPEG Layer 2 Audio (Musicam) Encoding	❍	❍	●	●
MPEG Layer 2 Audio (Musicam) Decoding	●	●	●	●
Dolby AC-3 2.0 Audio Encoding	❍	●	❍	●
Dolby AC-3 2.0 Audio Decoding	●	●	●	●
SMPTE-302 Audio Processing	●	●	●	●

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.14 DEC Module Types and Features

Table 15-13 DEC-S11 Module Type Definitions

Features	DEC-S11 Module Types			
	DEC-S11-STD	DEC-S11-STD-D	DEC-S11-PRO	DEC-S11-PRO-D
4:2:0 Video Decoding Capability	●	●	●	●
4:2:2 Professional Profile with Extended Window	❍	❍	●	●
Analog Video and Balanced Audio Interfaces	●	●	●	●
MPEG Layer 2 Audio (Musicam)	●	●	●	●
Dolby AC-3 2.0 Audio	❍	●	❍	●
One Stereo Pair of Audio	●	●	●	●
Two Stereo Pairs of Audio	●	●	●	●
SDI Video and AES Audio Interfaces	●	●	●	●
Fixed-Key Scrambling	❍	❍	●	●
SMPTE-302 Audio Decoding	❍	❍	●	●
Captions or Teletext Reconstruction, and VBI Sampling Reconstruction of Pass-Through Services	●	●	●	●

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.15 TMX Module Types and Features

Table 15-14 TMX-M12 Module Type Definitions

Features	TMX-M12 Module Types				
	TMX-M12-TNL1	TMX-M12-TNL2	TMX-M12-MUX	TMX-M12-MPH	
Tunnel-mode mapping to/from backplane	●	●	●	●	❍
Number of Supported Input Interfaces	1	2	2	2	2
Number of Supported Output Interfaces	1	2	2	2	2
SI insertion from Carousel or UDP stream	❍	❍	●	●	❍
TSID localization	❍	❍	●	●	❍
Demultiplex incoming TS to separate program elements	❍	❍	●	●	❍
Multiplex separate backplane elements into one TS	❍	❍	●	●	❍
Statmux locally-encoded and remotely-encoded streams	❍	❍	●	●	❍
MH Support	❍	❍	❍	●	❍
Scrambling Support	❍	❍	❍	❍	●

Legend	
Supported Feature	●
Unsupported Feature	❍

Table 15-15 TMX-M14 Module Type Definitions

Features	TMX-M14 Module Types
	TMX-M14-TNL4
Tunnel-mode mapping to/from VR backplane	●
Number of Supported Output Interfaces	4

Legend	
Supported Feature	●
Unsupported Feature	❍

15.3.16 GBE Module Types and Features

Table 15-16 GBE-C11 Module Type Definitions

Features	GBE-C11 Module Types and Feature Key Suffixes			
	GBE-C11-LAN	GBE-C11-LANTS	GBE-C11-VIPA	GBE-C11-FX*
Video on IP (VIP) — Support for VC function types: TS_TX, TS_RX, RTP_TX, or RTP_RX	❍	❍	●	●
VC 16 — Support for up to sixteen virtual channels.	●	●	●	●
VC 127 — Support for up to one hundred and twenty seven virtual channels.	❍	❍	❍	●
IPoTS — Support for IP on Transport Stream	❍	●	❍	●

Legend	
Supported Feature	●
Unsupported Feature	❍

* GBE-C11-FX is the ordering code for this key. Modules utilizing this feature key may self-identify themselves as ‘GBE-C11-STD’.

Chapter 16: NetVX Trap Descriptions 16

16.1 Overview of NetVX Traps and Alarms

This chapter provides a description of each alarm and trap message that the NetVX may issue. The NetVX provides the following classes of alarm notification.

16.1.1 Coding Alarms

- "Audio Degrade Alarms" on page 484
- "Audio Fault Alarm" on page 485
- "Decoder Degrade Alarms" on page 486
- "VANC Degrade Alarm" on page 503
- "VBI Degrade Alarm" on page 503
- "Video Degrade Alarms" on page 509
- "Video Fault Alarm" on page 510

16.1.2 General Alarms

- "Module Degrade Alarms" on page 489
- "Module Fault Alarms" on page 492
- "Network Degrade Alarms" on page 493
- "Network Fault Alarms" on page 495
- "Service Degrade Alarms" on page 496
- "Service Fault Alarm" on page 497
- "System Degrade Alarm" on page 498
- "System Fault Alarms" on page 501
- "VC Degrade Alarms" on page 504
- "VC Fault Alarm" on page 509
- "Start Up Traps" on page 510

16.2 Trap and Alarm Types

16.2.1 Audio Degrade Alarms

Trap Name: **Audio Degrade - Channel Not Present**
MIB Numbers: 01, 02
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Audio Channel Number: [Value 4]
Description: An encoder is configured to code an embedded audio channel but the specified audio channel is not present in the video input.
Additional Information: [Value 6]
Corrective Action(s):
1 Verify that the correct embedded audio group and channel are specified.
2 Verify that the source equipment is embedding audio in the desired group and channel.

Trap Name: **Audio Degrade - CRC Error**
MIB Numbers: 03, 04
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Audio Channel Number: [Value 4]
Description: The encoder is receiving CRC errors on its digital audio input or on its embedded audio channel.
Additional Information: [Value 6]
Corrective Action(s): Check the audio connection feeding the specified encoder.

Trap Name: **Audio Degrade - Format Not Supported**
MIB Numbers: 05, 06
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Audio Channel Number: [Value 4]
Description: There is a mismatch between the expected audio format and the audio format received. This mismatch may be due to one of the following:
- The encoder may be configured to receive and pass through compressed audio, but it is receiving uncompressed audio.
- There may be a mismatch between the configured and the received embedded audio input format.
- There may be a mismatch between the configured and the received embedded audio input rate.

Additional Information: [Value 6]
Corrective Action(s):
1 Verify that the source equipment is providing the desired audio format.
2 Verify that the encoder is configured to accept the desired audio format.

Trap Name:	**Audio Degrade - Configuration Error**
MIB Numbers:	112, 113
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Encoder Number: [Value 3]
Description:	Indicates an audio configuration error. Additional Information: [Value 6]
Corrective Action(s):	Verify that the audio encoder configuration matches that of the module itself. For example, if the module is keyed to provide Dolby audio only, check that the configuration does not specify MPEG audio.

Trap Name:	**Audio Degrade - A/V Sync Raise**
MIB Numbers:	124, 125
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Encoder Number: [Value 3]
Description:	This trap indicates that the system has made an audio/video synchronization adjustment. Additional Information: [Value 6]
Corrective Action(s):	This trap is informational. No action is required.

16.2.2 Audio Fault Alarm

Trap Name:	**Audio Fault - Loss of Audio**
MIB Numbers:	07, 08
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Encoder Number: [Value 3] Audio Channel Number: [Value 4]
Description:	The encoder is no longer receiving an audio signal. Additional Information: [Value 6]
Corrective Action(s):	1 Verify that the source equipment is providing audio. 2 Check the audio connection feeding the specified encoder.

16.2.3 Decoder Degrade Alarms

Trap Name: **MPEG Decoder Degrade - Audio Decode Errors**
MIB Numbers: 09, 10
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Audio Channel Number: [Value 4]
Description: The audio decoder is experiencing errors.
Additional Information: [Value 6]
Corrective Action(s):
1 Verify that the source equipment is providing audio.
2 If possible, check the audio connection feeding the source encoder.
3 Check that the decoder configuration is specifying the correct source.

Trap Name: **MPEG Decoder Degrade - Errors In Transport Stream**
MIB Numbers: 11, 12
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Description: The decoder is receiving a transport stream containing errors.
Additional Information: [Value 6]
Corrective Action(s):
1 Verify that the source equipment is providing a transport stream.
2 If possible, check feeds to the encoder.
3 Check that the decoder configuration is specifying the correct source.

Trap Name: **MPEG Decoder Degrade - No Audio**
MIB Numbers: 13, 14
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Audio Channel Number: [Value 4]
Description: A decoder is configured to decode audio, but audio is not available in the specified program.
Additional Information: [Value 6]
Corrective Action(s):
1 Verify that the source equipment is providing audio.
2 If possible, check the audio connection feeding the source encoder.
3 Check that the decoder configuration is specifying the correct source.

Trap Name: **MPEG Decoder Degrade - No Program**
MIB Numbers: 15, 16
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Description: A decoder is configured to decode a program, the transport stream indicates that there should be a program to decode yet there is none.
Additional Information: [Value 6]
Corrective Action(s):
1 Verify that the source equipment is providing a program.
2 If possible, check the connection feeding the source encoder.
3 Check that the decoder configuration is specifying the correct program.

Trap Name: **MPEG Decoder Degrade - No Stream**
MIB Numbers: 17, 18
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Description: A decoder is configured to decode a program but it is not receiving a transport stream.
Additional Information: [Value 6]
Corrective Action(s): Verify connections between the source equipment and the NetVX.

Trap Name: **MPEG Decoder Degrade - No Video**
MIB Numbers: 19, 20
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Description: A decoder is configured to decode video, but video is not available in the specified program.
Additional Information: [Value 6]
Corrective Action(s):
1 Verify that the source equipment is providing video.
2 If possible, check the video connection feeding the source encoder.
3 Check that the decoder configuration is specifying the correct source.

Trap Name:	**MPEG Decoder Degrade - Video Decode Errors**
MIB Numbers:	21, 22
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Decoder Number: [Value 3]
Description:	The video decoder is experiencing errors. Additional Information: [Value 6]
Corrective Action(s):	1 Verify that the source equipment is providing video. 2 If possible, check the video connection feeding the source encoder. 3 Check that the decoder configuration is specifying the correct source. 4 Check that the reference signal provided by the SYS-A22 is configured as the same type as the video being decoded by the decoder. Both settings should be either NTSC or PAL.

Trap Name:	**MPEG Decoder Degrade - Decryption Error**
MIB Numbers:	106, 107
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Decoder Number: [Value 3]
Description:	This trap indicates the decoder is experiencing a decryption error. Additional Information: [Value 6]
Corrective Action(s):	Verify and re-enter the decoder decryption key.

16.2.4 Module Degrade Alarms

Trap Name: **Module Degrade - Configuration Error**

MIB Numbers: 91

Message: [Message]

Variables: Trap Count Number: [Value 1]

Slot Number: [Value 2]

Description: Indicates an error in the configuration received by the system. This type of error is typically the result of a mis-configuration originating at one of the manual configuration interfaces such as the craft port, telnet, or front panel interface.

Encoder: BISS Configuration

- Cause: If an encoder issued this alarm, it may be because BISS encryption is enabled but a Session Word has not been specified.
- Solution: Verify whether or not BISS encryption has been enabled. If BISS is enabled, then verify that the Session Word has been specified.

Encoder: Stat Mux Configuration

- Cause: This trap is issued when one encoder is used as the source of more than one cross connection that is enabled to operate stat mux mode.
- Solution: Identify all of the cross connections that use the encoder referenced above. Check each cross connection destination to see if more than one of them has statmux enabled. Ensure only one destination has statmux enabled.

Encoder: Module Type and Feature Conflict

- Cause: This trap is issued if a module is not keyed with the ATSC feature bit but UDP is configured as the closed caption source.
- Solution: Change the “Closed Caption Source” to a value other than “UDP”.

Additional Information: [Value 6]

Other Possibilities...

If a module located in a SYS-1700 is reporting this error, then it is possible that the module is programmed for operation only in a SYS-200 or SYS-300 chassis. The module will not operate as desired under such conditions. Modules programmed for operation in SYS-200 and SYS-300 chassis must remain installed in these model chassis.

Corrective Action(s): Use the descriptive text (above) in this trap to identify the error’s cause and possible solution.

Message: The Vidiem Management System identifies most configuration errors and discrepancies. Use Vidiem to upload the configuration from the system reporting this error. Note any error messages, then use Vidiem to make corrections, and download the corrected configuration back to the unit.

Trap Name: **Module Degrade - General Degrade**

MIB Numbers: 81, 82

Message: [Message]

Variables: Trap Count Number: [Value 1]

Slot Number: [Value 2]

Description: This condition may be caused by either of the following:

All Modules

- The module in the specified slot is experiencing a degrade condition such as intermittent errors.
- A mismatch between the firmware on the active system controller and the firmware on the application module.

ATM-X11 Modules

- An optical transmitter is in use, but its performance is degraded.

Additional Information: [Value 6]

Corrective Action(s): Reset the module. The module upgrades during reset to the same version of firmware running on the system controller.
Verify that the module is configured as desired.

Trap Name: **Module Degrade - Module Inserted**
MIB Numbers: 79
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates that a module was inserted into the NetVX at the specified slot location.
Additional Information: [Value 6]
Corrective Action(s): None

Trap Name: **Module Degrade - Module Removed**
MIB Numbers: 80
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates that a module was removed from the NetVX at the specified slot location.
Additional Information: [Value 6]
Corrective Action(s): None Required

Trap Name: **Module Degrade - Module Wrong Type**
MIB Numbers: 23, 24
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: There is a mismatch between the module type that the slot is configured to receive and the installed module type.
Additional Information: [Value 6]
Corrective Action(s):
- Change the module type for this slot. - OR -
- Use the module type for which this slot is configured.

Trap Name: **Module Degrade - Protection Failback Event**
MIB Numbers: 89
Message: [Message]
Variables: Trap Count Number: [Value 1]
From: Slot Number: [Value 2]
To: Slot Number: [Value 3]
Description: Service has been restored to the module in slot [Value 2] from slot [Value 3].
Additional Information: [Value 6]
Corrective Action(s): None Required

Trap Name: **Module Degrade - Protection Failover Event**
MIB Numbers: 90
Message: [Message]
Variables: Trap Count Number: [Value 1]
From: Slot Number: [Value 2]
To: Slot Number: [Value 3]
Description: This trap was deprecated in the NetVX's 5.6.0 firmware release. This description remains here for backward-compatibility.
The module in slot [Value 2] is experiencing a loss of signal or has failed and the module in slot [Value 3] has picked up its service.
Additional Information: [Value 6]
Corrective Action(s):
1 Check, wiring, signals, and configuration for the module in slot [Value 2].
2 Contact technical support if you cannot determine the source of the module failover.

Trap Name: **Module Degrade - Protection Failover Raise/Clear**
MIB Numbers: 122, 123
Message: [Message]
Variables: Trap Count Number: [Value 1]
From: Slot Number: [Value 2]
To: Slot Number: [Value 3]
Description: Some event has triggered a failover from [Value 2] to slot [Value 3].
Additional Information: [Value 6]
Corrective Action(s):
1 Check, wiring, signals, and configuration for the module in slot [Value 2].
2 Contact technical support if you cannot determine the source of the module failover.

Trap Name: **Module Degrade - Status Change**
MIB Numbers: 127
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates a change in the module's operating status. This trap is sent whenever the slot state changes between any of the following states. Each of these states are maintained by 'cfg slot.n gen/state'.

- Booting
- Fault
- In Service
- None
- Not Present
- Offline
- Wrong Type

Additional Information: [Value 6]
Corrective Action(s): If the change in module state was unexpected, then locate the root cause.

- Reset the module, if necessary, to ensure it boots properly.
- Check that a module is actually present in the slot.
- Check that the model type of the actual module matches that for which the slot is configured.

16.2.5 Module Fault Alarms

Trap Name: **Module Fault - General Fault**
MIB Numbers: 25, 26
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: The module in the specified slot is experiencing a general fault.
Additional Information: [Value 6]

ATM-X11 Modules

- The module is configured to have an optical transmitter, but that transmitter is not present.
- An optical transmitter is in use, but its performance is outside acceptable bounds.

Corrective Action(s):

- Reset the module.
- Verify that the module is configured as desired.

Trap Name: **Module Fault - Module Not Present**
MIB Numbers: 27, 28
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: The system expects a module to be present, but the module is not present.
Additional Information: [Value 6]
Corrective Action(s):

1 Configure the slot to not expect a module.
2 Add the expected module.
3 Add or replace the expected module.

SYS-A12 System Controllers

The NetVX may also issue this fault when a backup system controller in slot 2 has taken over service from a failed system controller in slot 1. At such a point, the backup controller ceases communication with the failed controller and as a result it can no longer verify the presence of the failed controller located in slot 1. This condition may be the result of a manual failover to slot 2, a failure of the secondary Ethernet connection linking the two controller modules, or a failure of the controller in slot 1. This alarm is an expected behavior under any of these conditions.

Trap Name: **Module Fault - Software Fault**
MIB Numbers: 77, 78
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates the module is experiencing a serious software fault. This fault condition is very rare and may be the result of an incomplete software upgrade.
Additional Information: [Value 6]
Corrective Action(s):

1 Use the “util firmware” command to move the system back to a previous firmware release.
2 If the previous release fixes the problem, try upgrading the system firmware again.
3 An intermittent IP connection could possibly undermine the NetVX’s ability to receive a complete firmware download. Troubleshoot IP connectivity between the PC providing firmware (running the “Upgrade.exe” utility) and the NetVX.

Trap Name: **Module Fault - Booting**
MIB Numbers: 128, 129
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates the module is booting due to any of the following reasons.

- Internal Request: Indicates the module encountered an internal error and reset. This action triggers failover to a backup module if one is available.
- Internal Time-out: Indicates the module's watchdog timer caused a reset. This action triggers failover to a backup module if one is available.
- User (or External) Request: Indicates a user-initiated reset through one of the user interfaces. This action triggers failover to a backup module if one is available.

Additional Information: [Value 6]
Corrective Action(s): This trap is informative. No corrective action is necessary.

16.2.6 Network Degrade Alarms

Trap Name: **Network Degrade - Configuration Error**
MIB Numbers: 99, 100
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Interface Number: [Value 3]
Description: Indicates a configuration error causing a degrade in the network. This error is most likely caused when the TMX-100 attempts to incorporate a mis-configured carousel data file into a multiplexed output. See below for possible causes.
Additional Information: [Value 6]
Corrective Action(s):

Format Corrupt

- The carousel file has an internal error that violates the specified format. This can apply to the current, next, or update file.
- Verify that the source that creating the carousel file is configured as desired and that all settings are consistent with one another.

Insufficient Bandwidth

- The carousel's configured bitrate is too low to carry the data from the current file. Depending on the cycle times of the data being multiplexed into the transport stream, this condition may be temporary (a packet was sent later than its scheduled time) or permanent (the file has too much data for the allocated bandwidth).
- If you are attempting to stream several carousel files simultaneously, the collective bandwidth may exceed the rate configured (cfg/slot.s/mux/mxifc.m crslrate) for carousel streaming.

PID Conflict

- A data segment in the carousel file specified a PID that conflicts with another PID in the transport stream.
- Check the PID setting of the carousel streamer.

No File

- If the carousel is configured to be active, a file should exist to be streamed. If no file has been provided in the appropriate directory, a fault will be asserted.
- Verify that FTP and any other network settings and connections are properly configured. Verify that the NetVX's FTP interface (cfg sys/ctl ftp) is enabled.

Trap Name: **Network Degrade - Errors in Input Signal**

MIB Numbers: 29, 30

Message: [Message]

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Interface Number: [Value 3]

Description: Indicates errors in the signal on the specified network interface input.

ATM-X11

- (A) Indicates that the BITS signal is either not present or present with errors.
- (B) Indicates that the expected Path Trace value, set using the (cfg slot.s/atm/ifc.m rxpathtraceexp), does not match the received path trace status value (stat slot.s/atm/ifc.1/ss rxPathTraceRcv).

Additional Information: [Value 6]

Corrective Action(s):

- (A) Check the optical link budget.
- (A) Check cables feeding the network signal to the NetVX™.
- (A) Check that rates on the NetVX™ and the ATM switch correlate.
- (A) ATM Remote Defect Indicator (RDI) errors may also trigger this trap when the interface is operating bidirectional mode.
- (B) Coordinate with the user on the far-end sending device to ensure the correct line on this point-to-point connection is being used on each end.

GBE-C11

- Indicates the input signal either is not present, or is present with errors.

Corrective Action(s):

- Check the cable(s) feeding the network signal to the GBE module.
- Check that the modules IP settings are correct.

Trap Name: **Network Degrade - Receive Buffer Overflow**

MIB Numbers: 118, 119

Message: [Message]

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]

Description: Indicates the demultiplexer's PSI data receive buffer has exceeded its 1.0 Mbps rate limit. This rate limit controls the amount of PSI data that can be processed on a single demux interface.

Additional Information: [Value 6]

Corrective Action(s):

- Try to reduce the amount of optional PSI data, such as EITs or ETT's, which describe programs "too" far into the future (e.g. one week or more). The amount of data may be reduced by increasing the period of time (cycle time) between which PSI data is transmitted.
- Verify that the multiplexer is not putting program data, such as video or audio, on any PIDs on which the demultiplexer is expecting to find PSI data.

Trap Name: **Network Degrade - Transmit Buffer Overflow**

MIB Numbers: 85, 86

Message: [Message]

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]

Description: Indicates that the rate at which data on this VC is received by the TMX-M12 VC transmit buffer is higher than the provisioned transmit bit rate. This situation causes the TMX-M12 output's policing function to discard cells.

Additional Information: [Value 6]

Corrective Action(s): Reconcile the rate at which data is sent to this VC with the VC's provisioned transmit bit rate.

16.2.7 Network Fault Alarms

Trap Name: **Network Fault - Loss of Input Signal**

MIB Numbers: 31, 32

Message: [Message]

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Interface Number: [Value 3]

Description: Indicates a loss of signal on the specified ATM interface's input.
This trap will cause a failover on primary ATM modules that have redundant backups.

ATM-X11

Indicates that the ATM optical interface is configured to receive data but and SFP module is not present to do so.
Additional Information: [Value 6]

Corrective Action(s):
1 Check cables providing the network signal to the NetVX.
2 An ATM Alarm Indication Signal (AIS) is one possible cause of this trap. Check the equipment in the transmission chain feeding this module.
3 Check that the source device is providing a signal.
4 Check that only the receive interfaces that need to be on are on. For example, the TMX module provides the ability to turn off an input interface. If an input the interface is set to on, and it is not in use, it may issue this warning.

Trap Name: **Network Fault - Transport Stream Errors**

MIB Numbers: 95, 96

Message: [Message]

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Interface Number: [Value 3]

Description: Indicates the system could not locate the Program Allocation Table (PAT) in an incoming transport stream. The transport stream may be entering the TMX module through an internal demux (DMX) interface, or through a physical, external receive interface.
Additional Information: [Value 6]

Corrective Action(s):

Receive Interface

- Check the cable providing the signal to the TMX receive interface.
- Check that the source device is providing a transport stream.
- Check that only the receive interfaces that need to be on are on. For example, the TMX module provides the ability to turn off an input interface. If an input the interface is set to on, and it is not in use, it may issue this warning.

Demux Interface

- Check that the cross connection providing the signal to the demux interface is configured with the desired source and destination.
- Check that the cross connection's source VC is providing a signal.

16.2.8 Service Degrade Alarms

Trap Name:	**Service Degrade - Errors in Service**
MIB Numbers:	33,34
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Main Cross Connection Number: [Value 3] Backup Cross Connection Number: [Value 4]
Description:	Indicates that the specified cross connection is experiencing a degrade in service. This service degrade is the result of one or more degrade alarm conditions affecting the cross connection's source or destination module(s). Additional Information: [Value 6]
Corrective Action(s):	Resolve any degrade conditions in the source or destination modules for this cross connection: 1 Look in the trap log for a degrade trap issued at or around the same time as this one. 2 If such a trap exists, check if the associated module is a source or a destination for the cross connection identified by this trap.

Trap Name:	**Service Degrade - Protection Failover Event**
MIB Numbers:	103
Message:	[Message]
Variables:	Trap Count Number: [Value 1] From Cross Connection Number: [Value 2] To Cross Connection Number: [Value 3]
Description:	Indicates a switch has taken place between two primary cross connection's. One connection may have served as a backup for the other. Additional Information: [Value 6]
Corrective Action(s):	Resolve any degrade conditions in source or destination modules for this cross connection.

Trap Name:	**Service Degrade - Protection Switch**
MIB Numbers:	130, 131
Message:	[Message]
Variables:	Trap Count Number: [Value 1] From Cross Connection Number: [Value 2] To Cross Connection Number: [Value 3]
Description:	Indicates a cross connection's source has failed and that it's backup cross connection has taken over the service. Additional Information: [Value 6]
Corrective Action(s):	Resolve any degrade conditions in the source or destination modules for this cross connection: 1 Look in the trap log for any related degrade traps issued at or around the same time as this one. 2 If such a trap exists, check if the associated module is a source or a destination for the cross connection identified by this trap.

16.2.9 Service Fault Alarm

Trap Name:	**Service Fault - Loss of Service**
MIB Numbers:	35, 36
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Cross Connection Number: [Value 3]
Description:	Indicates that the specified cross connection is experiencing a loss of service (LOS). This LOS is associated with one or more fault alarm conditions affecting the cross connection's source or destination module(s). Additional Information: [Value 6]
Corrective Action(s):	Resolve any fault conditions in the source or destination modules for this cross connection: 1 Look in the trap log for a degrade trap issued at or around the same time as this one. 2 If such a trap exists, check if the associated module is a source or a destination for the cross connection identified by this trap.

16.2.10 System Degrade Alarm

Trap Name: **System Degrade - Configuration Error**

MIB Numbers: 97, 98

Message: [Message]

Variables: Trap Count Number: [Value 1]
[Value 2]
[Value 3]
[Value 4]

Description: Indicates a configuration error has occurred. The system checks its configuration to avoid errors. This trap indicates a condition that could not be reconciled according to the system's constraints. Causes for this error may include, but are not limited to the following.

GPI-Triggered Configuration Load Missing

- Cause: A specified configuration is programmed to load when a GPI is closed, but that configuration does not exist.
- Solution: Either add the missing configuration, or change the name of an existing configuration to match that of the targeted configuration.

Keyed Feature Mismatch

- Cause: An attempt was made to activate a keyed feature that the current software key does not allow.
- Solution: Modify the configuration to not activate the keyed feature.

Non-Unique Program Base PIDs

- Cause: The system-level program base PIDs are not unique. These PIDs are configured through the craft port's "cfg sys/pgm" branch and include: AudPid, DataPid, EcmPid, PcrPid, PmtPid, VidPid. Vidiem provides configuration access to these PIDs through:
  System > (right-click) + Properties > Fundamentals > Program
- Solution: Change one of the base PID (and any of it's dependent PIDs) as needed to make the base PIDS unique.

Daylight Saving Time

- Cause: This trap may be issued if a transition into or out of Daylight Saving Time passed more than two months prior and the system has not been re-configured for the next Daylight Saving time transition.
- Solution: Configure the system for the upcoming Daylight Saving Time transition.

Application Module: Protection chain is not terminated at slot.x

- Cause: The module at the end of the protection chain (the first one used in the event of a failover) is not designated as a backup module.
- Solution: Note the slot number specified in the trap message and designate the module in that slot as a backup.

Application Module: Cyclic protection chain detected at slot.x

- Cause: The combination of backup modules form a circular path. For example: 'A' is protected by 'B', 'B' is protected by 'C', and 'C' is protected by 'A'.
- Solution: Note the slot number specified in the trap message and designate the module in that slot as a backup.

Additional Information: [Value 6]

Corrective Action(s): Change the model type in the system configuration to match that of the actual system.

Trap Name:	**System Degrade - Fan Failure**
MIB Numbers:	37, 38
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Fan Number: [Value 3]
Description:	Indicates that one of the system's fans has failed. Additional Information: [Value 6]
Corrective Action(s):	1 Verify that the fan is not working. 2 Replace the broken fan.

Trap Name:	**System Degrade - Front Panel Failure**
MIB Numbers:	39, 40
Message:	[Message]
Variables:	Trap Count Number: [Value 1]
Description:	Indicates the front panel controller has experienced a serious error. Additional Information: [Value 6]
Corrective Action(s):	Contact technical support to arrange to return your system for servicing.

Trap Name:	**System Degrade - General Purpose Input Raise**
MIB Numbers:	101
Message:	[Message]
Variables:	Trap Count Number: [Value 1]
Description:	Indicates that the specified GPI has changed state.
Corrective Action(s):	GPIs are triggered by external equipment and/or controls. Conditions responsible for triggering the GPI may or may not require corrective action depending on the application.

Trap Name:	**System Degrade - Over Temperature**
MIB Numbers:	41, 42
Message:	[Message]
Variables:	Trap Count Number: [Value 1]
Description:	Indicates that the system's internal temperature has risen above 70 degrees Celsius. The system is not designed to operate at these temperatures and may provide inconsistent service, or may fail to operate. Additional Information: [Value 6]
Corrective Action(s):	1 Check that the system's front air intake and rear air exhaust ports are not obstructed. 2 Ensure that both fans are operational. 3 Power down the system. 4 Move the system to a cooler environment where such overheating is not a possibility.

Trap Name:	**System Degrade - Power Supply Failure**
MIB Numbers:	43, 43
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Power Supply: [Value 3]
Description:	Indicates that one of the system's modular power supplies has failed. Additional Information: [Value 6]
Corrective Action(s):	Replace the failed power supply.

Trap Name: **System Degrade - Relay Failure**
MIB Numbers: 45, 46
Message: [Message]
Variables: Trap Count Number: [Value 1]
GPO Number: [Value 3]
Description: Indicates that the system has detected that a GPO relay is not in the state expected based on software configuration.
Additional Information: [Value 6]
Corrective Action(s): Disconnect any equipment that uses the broken GPI or GPO as a trigger.

Trap Name: **System Degrade - Serial Port Error**
MIB Numbers: 104, 105
Message: [Message]
Variables: Trap Count Number: [Value 1]
Serial Port Number: [Value 3]
Description: Indicates that the system has experienced a problem with router control such as no echo, or no prompt returned by the router. This trap is only issued when the serial port is configured to operate with a router.
Additional Information: [Value 6]
Corrective Action(s):
1 Check the external serial port connections between the NetVX's system controller and the NetVX connector board.
2 Check the serial port connection between the NetVX and the external equipment.
3 Verify that the serial port baud rate is the same on both the NetVX and on the external equipment.

Trap Name: **System Degrade - Firmware Bind Successful**
MIB Numbers: 108
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates that the system has successfully bound the firmware release.
Additional Information: [Value 6]
Corrective Action(s): None required.

Trap Name: **System Degrade - Firmware Bind Unsuccessful**
MIB Numbers: 109
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates that the system could not successfully bind the targeted firmware release. This error may be caused by a corrupt, or incomplete firmware load.
Additional Information: [Value 6]
Corrective Action(s):
1 Make a second attempt to bind to the desired firmware load. If the second bind attempt also fails, then try the following step(s).
2 Use the Upgrade.exe utility (included on the release CD) to reload the firmware, then attempt to bind and reset the system again.
3 If the above steps fail, then contact technical support.

Trap Name: **System Degrade - Reference Error**
MIB Numbers: 110, 111
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Indicates the system controller has lost its reference signal input.
Additional Information: [Value 6]
Corrective Action(s):
1 Verify that the cable and connections to the system controller do not have any breaks.
2 Verify that the reference source is operating properly.

Trap Name: **System Degrade - User-Initiated Event**
MIB Numbers: 126
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates the system has experienced any one of the following user-initiated events.

- Manual module failover (this does not include failover initiated by the system). Note that module failback has its own trap event, whether initiated by the system or the operator.
- Manual cross-connect failover (this does not include failover initiated by the system).
- Module or system reset.
- Module or system keying.
- Configuration load, save or delete from file.
- Profile load, save or delete from file.
- System date or time change.
- SNMP community name change.
- Password change.
- System startup.

Additional Information: [Value 6]
Corrective Action(s): This trap is informative. No corrective action is necessary.

16.2.11 System Fault Alarms

Trap Name: **System Fault - Loss of 3.3V Supply**
MIB Numbers: 47, 48
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates a loss of 3.3 volt power. This fault may be due to a partial or intermittent power supply failure.
Additional Information: [Value 6]
Corrective Action(s): Replace the power supply as soon as possible.

Trap Name: **System Fault - Loss of 5V Supply**
MIB Numbers: 49, 50
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates a loss of 5 volt power. This fault may be due to a partial or intermittent power supply failure.
Additional Information: [Value 6]
Corrective Action(s): Replace the power supply as soon as possible.

Trap Name: **System Fault - Loss of +12V Supply**
MIB Numbers: 51, 52
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates a loss of +12 volt power. This fault may be due to a partial or intermittent power supply failure.
Additional Information: [Value 6]
Corrective Action(s): Replace the power supply as soon as possible.

Trap Name: **System Fault - Loss of -12V Supply**
MIB Numbers: 53, 54
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates a loss of -12 volt power. This fault may be due to a partial or intermittent power supply failure.
Additional Information: [Value 6]
Corrective Action(s): Replace the power supply as soon as possible.

Trap Name: **System Fault - Fan Failure**
MIB Numbers: 114, 115
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates both fans in a VR-1700 have failed.
Additional Information: [Value 6]
Corrective Action(s): 1 Immediately replace the fans in the affected system.
2 Power down the system immediately if replacement fans are not available.

Trap Name: **System Fault - Power Supply Failure**
MIB Numbers: 116, 117
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates that both of the VR-1700's power supplies have failed, or if only a single power supply is present then only that one power supply has failed.
Additional Information: [Value 6]
Corrective Action(s): Immediately replace the failed power supply.

16.2.12 VANC Degrade Alarm

Trap Name:	**VANC Degrade - VANC Error**
MIB Numbers:	55, 56
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Encoder Number: [Value 3]
Description:	Indicates that encoder dropped VANC packets. This can occur for several reasons, such as errors in the received signal, or receiving VANC data at a rate higher than the provisioned transmit bit rate. This situation results in loss of VANC data before encoding. Additional Information: [Value 6]
Corrective Action(s):	Use the “cfg slot.s/enc.m/vanc rate” command to increase the amount of bandwidth dedicated to VANC data. If the input signal has errors, provide a clean signal.

Trap Name:	**VANC Degrade - VANC Splice**
MIB Numbers:	132
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Encoder Number: [Value 3]
Description:	Indicates the time at which a splice point event occurred. Additional Information: [Value 6]
Corrective Action(s):	None required.

16.2.13 VBI Degrade Alarm

Trap Name:	**VBI Degrade - Excessive VBI Errors**
MIB Numbers:	57, 58
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Encoder Number: [Value 3]
Description:	Indicates excessive parity errors on the VBI signal. Additional Information: [Value 6]
Corrective Action(s):	1 Use the “stat slot.s/enc.m/vbi/fld.f/lin.l err” and “stat slot.s/dec.m/vbi/fld.f/lin.l err” commands to check error counts on each line. If errors increment on all the VBI lines, then check the VBI source equipment. 2 If encoder errors increment on a single VBI line, then check the encoder’s configuration for insertion on that line. 3 If decoder errors increment, then begin by checking that the source equipment or encoder are providing VBI data on the specified line. Next check the decoder’s VBI settings for a configuration error.

16.2.14 VC Degrade Alarms

Trap Name: **VC Degrade - AAL-1 Un-correctable Errors**
MIB Numbers: 59, 60
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: Indicates that more AAL-1 errors were received than could be corrected. This error may be due to any of the following causes.

- An ATM switch throwing away cells because of network congestion.
- An over-subscribed connection.
- A mis-configuration.
- A bad physical link can also cause bit errors which could trigger this alarm condition.

Additional Information: [Value 6]
Corrective Action(s):
1 Check bit rate settings on both the transmitting and the receive side of this VC. Verify that both of these settings are set properly with respect to one another (make sure that both rate correspond).
2 On the transmit side, check cables between source equipment and the ATM switch or network interface.
3 On the receive side, check cables between the ATM switch or network interface and the NetVX.

Trap Name: **VC Degrade - AAL-5 CRC Errors**
MIB Numbers: 61, 62
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: These errors may be due to any of the following causes.

- An ATM switch throwing away cells because of network congestion.
- An over-subscribed connection.
- A mis-configuration.
- A bad physical link can also cause bit errors which could trigger this alarm condition.

Additional Information: [Value 6]
Corrective Action(s):
1 Check bit rate settings on both the transmitting and the receive side of this VC. Verify that both of these settings are set properly with respect to one another. e.g. Transmit does not exceed receive, or vice versa.
2 On the transmit side, check cables between source equipment and the ATM switch or network interface.
3 On the receive side, check cables between the ATM switch or network interface and the NetVX.

Trap Name:	**VC Degrade - Alarm Indication Signal (AIS) Received**
MIB Numbers:	63, 64
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Virtual Channel Number: [Value 3] Virtual Channel Type: [Value 5]
Description:	Indicates a failure affecting this VC has been detected by “upstream” piece of equipment in the ATM network. Additional Information: [Value 6]
Corrective Action(s):	1 Verify this error condition with your network operations center or service provider. 2 If possible, re-configure the signal on each end to use a non-affected virtual channel.

Trap Name: **VC Degrade - Configuration Error**

MIB Numbers: 93

Message: [Message]

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Type: [Value 5]

Description: Indicates a VC configuration error. Generally this trap indicates either an inconsistency or information missing from a VC's configuration.

General Solution: The Vidiem Management System identifies most configuration errors and discrepancies. Use Vidiem to upload the configuration from the system reporting this error. Note any error messages, then use Vidiem to rapidly make corrections, and download the corrected configuration back to the unit.

This trap may be caused by any of the following.

GBE-C11-Specific Issues

- Cause: This trap may be caused by an insufficient number of FEC receive buffers available for the number of VCs trying to transmit to the module.
- Solution: When this trap is raised for the GBE-C11, there is no corrective action that may be taken on the local NetVX system. Generally, the remote NetVX must be configured to send fewer FEC-enabled VCs to the local GBE-C11 module. Any of the following possibilities may be used.
  (a) Have the transmitter use {none, low, medium} FEC for this channel.
  (b) Have the transmitters for other channels use {none, low, medium} instead of high FEC.

ATM-M11 and ATM-S11-Specific Issues

- Cause: VPI Conflict – This error is raised when more than one VC on the same interface are configured to use the "ATM-VP" function and are configured with the same VPI value.
- Solution: When this trap is raised for an ATM module, change either the function or the VPI of one of the offending ATM VCs.

TMX-M12 Interface-Level PID Conflict: Over-Subscribed PID

- Cause: More than one VC on the interface is attempting to operate on a given PID, thereby causing a PID conflict.
- Solution: On each interface, check the list of Demux VCs for two or more VCs with (a) Their "Function" set to "PID" and, (b) Identical PID values; do the same for the Mux VCs. If any such match is identified, change either the "PID" value to make the PIDs unique, or (if possible) change the VCs function – which will cause the system to disregard the PID value.

TMX-M12 Interface-Level PID Conflict: PID Value Out of Range

- Cause: One of the manually-mapped PID values on this VC is under "16"; values under "16" are reserved. Manually-mapped PID values are specified in the "System" branch under "Program".
- Solution: Verify that none of the manually-specified PID values on this VC are under "16".

TMX-M12 Interface: Attempting to Statmux Data from a Remote Encoder

- Cause: StatMux was enabled on a VC receiving data from a source other than a local encoder.
- Solution: Disable StatMux on the VC causing this alarm.

TMX-M12 Interface: Mis-Configured VC Program Number

- Cause: The VC's function is set to PID, but a program number, other than zero, is specified for the VC.
- Solution: Either change the VC's function from "PID" to "Program", or change the VC's program number to zero.

Additional Information: [Value 6]

Trap Name: **VC Degrade - Loss of Receive Continuity**
MIB Numbers: 65, 66
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: Indicates a loss of continuity count cells. Typically this implies that there has been a loss of connection between the transmission source and this device.
Additional Information: [Value 6]
Corrective Action(s):
1 Verify this error condition with your network operations center or service provider.
2 If possible, reconfigure the signal on each end to use a non-affected virtual channel.

Trap Name: **VC Degrade - No Destination**
MIB Numbers: 83, 84
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates one of the following:
- A lack of a route to a destination.
- In the case of an IP VC using UDP, transmission to a UDP port that is not configured.

Additional Information: [Value 6]
Corrective Action(s):
1 Verify that the necessary virtual channels and cross connections are present to accommodate reaching the desired destination.
2 Verify that the target IP address and UDP port are configured.

Trap Name: **VC Degrade - Receive Buffer Overflow**
MIB Numbers: 67, 68
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: Indicates that the rate at which data on this VC is received from the network is higher than the provisioned (expected) receive bit rate. This situation causes the ATM input's policing function to discard cells.
Additional Information: [Value 6]
Corrective Action(s): Reconcile the rate at the (remote) source and the VC's provisioned receive bit rate by changing the one to match the other.

Trap Name:	**VC Degrade - Transmit Buffer Overflow**
MIB Numbers:	69, 70
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Virtual Channel Number: [Value 3] Virtual Channel Type: [Value 5]
Description:	Indicates that the rate at which data on this VC is received by the ATM transmit buffer is higher than the provisioned transmit bit rate. This situation causes the ATM output's policing function to discard cells. Additional Information: [Value 6]
Corrective Action(s):	Reconcile the rate at the (local) source and the VC's provisioned transmit bit rate by changing the one to match the other.

Trap Name:	**VC Degrade - Transport Stream Error**
MIB Numbers:	87, 88
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2]
Description:	Indicates errors in a transport stream processed by the TMX-M12. Errors causing this alarm may include any of the following: • The VC responsible for carrying this transport stream experiences a degrade condition. • A program is not present. • System information tables have continuity count errors. • System information tables have CRC errors. • The PAT is missing form the transport stream. Additional Information: [Value 6]
Corrective Action(s):	• Check the configuration of any cross connection responsible for carrying a signal to the TMX-M11. • Check the TMX-M11's physical input connections. • Check the configuration of any VCs responsible for carrying this transport stream's signal. • If the signal originates on an encoder, check the encoder's provisioning and its input wiring.

16.2.15 VC Fault Alarm

Trap Name: **VC Fault - Transport Stream Error**
MIB Numbers: 120, 121
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: Indicates a fault on the specified IP or ATM VC. This fault can result from any of the following causes.

- The received transport stream rate is not constant or goes to zero.
- No PCR values can be found to estimate the transport stream rate.

Additional Information: [Value 6]
Corrective Action(s):

- Verify that the source is providing a constant bit rate (CBR) stream.
- Verify that the source is providing a transport stream. Verify the that the transport stream is present on any intermediate links.

16.2.16 Video Degrade Alarms

Trap Name: **Video Degrade - EDH Error**
MIB Numbers: 71, 72
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates EDH line or path errors in incoming video.
Additional Information: [Value 6]
Corrective Action(s): Check the cabling feeding the encoder.

Trap Name: **Video Degrade - Sync Error**
MIB Numbers: 73, 74
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates sync errors in incoming video.
Additional Information: [Value 6]
Corrective Action(s): Check the cabling feeding the encoder.

16.2.17 Video Fault Alarm

Trap Name:	**Video Fault - Loss of Video**
MIB Numbers:	75, 76
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Encoder Number: [Value 3]
Description:	Indicates a loss of the encoder's video signal. Additional Information: [Value 6]
Corrective Action(s):	1 Check the cabling feeding the encoder. 2 Check the video source.

16.2.18 Start Up Traps

Trap Name:	**Cold Start Trap**
MIB Numbers:	None
Message:	[Message]
Variables:	Trap Count Number: [Value 1]
Description:	This trap indicates the time at which the system was started or power-cycled. Additional Information: [Value 6]

Trap Name:	**Warm Start Trap**
MIB Numbers:	None
Message:	[Message]
Variables:	Trap Count Number: [Value 1]
Description:	This trap indicates the time at which the system was reset. Additional Information: [Value 6]

16.3 NetVX Trap Variable Definitions

This section describes the variables displayed in each NetVX trap message.

16.3.1 Trap Count Number

This variable provides a counter that is maintained by the system controller and is increased by “1” whenever a new trap is sent. This counter is set to “0” whenever the system controller is reset, powered up, or service switched.

This count is maintained by each system controller. Therefore, if you monitor more than one system, you may receive identical trap count numbers.

System Controller Modules: 1 = IP VC

16.3.2 Slot Number

This variable indicates any slot numbers associated with a trap. Most traps reference a single module.

16.3.3 From: Slot Number

This variable is applicable only to traps indicating failover and failback operations. In a trap message, this variable represents the number of the slot “from which” active operation or service is transferred.

16.3.4 To: Slot Number

This variable is applicable only to traps indicating failover and failback operations. In a trap message, this variable represents the number of the slot “to which” active operation, or service, is transferred.

16.3.5 From Slot State:

This variable indicates the state that the slot was originally in.

16.3.6 To Slot State:

This variable indicates the state that the slot was moved to.

16.3.7 Reset Description

Indicates the reason for the module reset.

16.3.8 Encoder Number

Identifies the number of the encoder causing a trap. This value is always one for the ENC-S11 because this module has only one encoder.

16.3.9 Decoder Number

Identifies the number of the decoder causing a trap. This value is always one for the DEC-S11 because this module has only one decoder.

16.3.10 Audio Channel Number

This variable helps report a condition specific to an audio channel. Used with the slot number, it uniquely identifies the affected audio channel.

1 = Primary Audio Channel

2 = Secondary Audio Channel

16.3.11 Virtual Channel Number

Identifies the VC causing a trap.

16.3.12 Virtual Channel Type

Identifies the type of VC causing a trap. Note the type of module emitting the trap and refer to the table below.

ATM-x11 Modules: 1 = ATM VC

TMX-M11 Modules: 1 = Demux VC, 2 = Mux VC

16.3.13 Cross Connection Number

Identifies the NetVX cross connection causing a trap. Indicates he number of a cross connection involved in the cause of a trap condition. Typically the cross connection number is presented in the case of a signal having failed over from one cross connection to another due to some sort of failure. In the this trap two cross connection numbers are presented, one for the original connection and another for the backup.

16.3.14 Fan Number

Identifies a fan that has failed

1 = The fan located on the right when looking at the system from the rear

2 = The fan located on the left when looking at the system from the rear.

16.3.15 Interface Number

The system's ATM modules each have two interfaces. This variable identifies the ATM interface causing the trap.

1 = SONET (OC3/SDH) Interface

2 = PDH (DS3/E3) Interface

16.3.16 Serial Port Number

Identifies the serial port causing a trap.

1 = Serial Port 1

2 = Serial Port 2

16.3.17 GPO Number

Identifies the GPO causing a trap.

The indicated number (1-4) is the number of the GPO as labelled on the rear of the system.

16.3.18 Power Supply

Identifies the power supply causing a trap. Labels on the rear of the system indicate the respective power supply locations.

1 = Primary Power Supply

2 = Secondary Power Supply

Chapter 17: NetVX Bandwidth Overview and Management

17

17.1 NetVX Backplane Bandwidth Considerations

The NetVX's maximum backplane bandwidth is 450 Mbps, however significantly higher rates are possible by planning module locations within the system. Please contact technical support if your application requires a higher rate.

If your application may be nearing the backplane limit, then use the following steps to determine the amount of backplane bandwidth that your system is using.

1. Identify the source of all the cross connections in the system.
2. Identify the rate at which each cross connection's source is providing data. Table 17-1 lists each type of VC that can operate as a cross connection source and it also identifies the configuration parameter used to set the rate. These same rates are listed in the Vidiem™ Element Management System's VC configuration tables and dialogs.
3. Sum the rates identified in step 2. Include the rate for each cross connection on the system even if more than one cross connection share the same source. This is necessary because (generally) each cross connection consumes some amount of backplane bandwidth.

Table 17-1 Parameters Controlling the Rate of Source VC Bandwidth Contribution to the Backplane

Module Type	Craft Port Rate Parameter	Location of Parameter Control in the Vidiem™ Element Management System
SYS-G10 SYS-A12 SYS-A22	cfg slot.s/ip/vc.m rxrate	Modules > IP Modules > (Double-Click) SYS-###; VC Control > VC Rates; IP TxRate (entry box)
GBE-C11	cfg slot.s/ip/vc.m rxrate	Modules > IP Modules > (Double-Click) GBE-###; VC Control > VC Rates; IP TxRate (entry box)
ENC-S11 ENC-S21 ENC-H11	cfg slot.s/enc.m/pgm tsrate	Modules > Encoders > (Double-Click) ENC-###; Program; TS Rate (box)
ATM-M11 ATM-S11 ATM-L11 ATM-X11	cfg slot.s/atm/vc.m rxrate	Modules > ATM Interfaces > (Interface) > (Double-Click) VC; VC Control > VC Rates; ATM Rx Rate (entry box)
TMX-M12 TMX-M14	cfg slot.s/mux/dxvc.m rate	Modules > TS Demultiplexers > (DX Interface) > (Double-Click) VC > VC Control; Policing Rate (entry box)

Related Topics

- Section 17.2, "NetVX Module Bandwidth Usage" on page 514
- Section 17.3, "Range of NetVX Encoder Rates" on page 515
- Section 17.4, "Overview of the Program Transport Stream Rate" on page 516
- Section 17.5, "ATM Standards and Rate Calculations" on page 519

17.2 NetVX Module Bandwidth Usage

Each NetVX module has its own maximum input and maximum output limits. Table 17-2 characterizes these limits.

Table 17-2 Module Ingress and Egress Bandwidth

Module Type		Maximum Input From Module to Backplane (1) (Mbps)	Maximum Output from Backplane to Module (Mbps)
SYS-G10		20.00	20.00
SYS-A12, SYS-A22		12.00	12.00
GBE-C11		450.00	450.00
ENC-S11		400.00 = (50 Mbps x 8 Cross Connections)	Not Applicable
ENC-H11		108.00	Not Applicable
DEC-S11		Not Applicable	66.00
ATM-M11, ATM-S11, ATM-L11, ATM-X11 (2)	ATM	280.00	160.00
	AAL-1	450.00	193.00
	AAL-5	450.00	193.00
TMX-M12		428.00	428.00
TMX-M14		Not Applicable	428.00

Note: (1) Maximum Input to Backplane: This column includes multicasting. Multicasting on the NetVX allows a signal originating on one module to be sent to up to eight other modules.
(2) ATM Modules: Maximum ATM module rates indicate the sum of bandwidth used by both the OC-3 and the DS-3 interfaces.

Related Topics

- Section 17.1, "NetVX Backplane Bandwidth Considerations" on page 513
- Section 17.3, "Range of NetVX Encoder Rates" on page 515
- Section 17.4, "Overview of the Program Transport Stream Rate" on page 516
- Section 17.5, "ATM Standards and Rate Calculations" on page 519

17.3 Range of NetVX Encoder Rates

The following table describes the range of rates for the NetVX's various encoder modules.

Table 17-3 Encoder Transport Stream and Video Rate Ranges

Module Type	Minimum TS Rate	Minimum TS Rate (I-Frame Only)	Maximum Video Rate (a)	Maximum TS Rate
ENC-H11	8.0 Mbps (12.0 Mbps recommended)	25.0 Mbps	(b)	108.0 Mbps
ENC-S11	0.1 Mbps	10.0 Mbps	50.0 Mbps (c)	70.0 Mbps
ENC-S21	0.1 Mbps	10.0 Mbps	15.0 Mbps (c)	18.0 Mbps
AUD-D14	0.1 Mbps	N/A	N/A	18.0 Mbps

Note: (a) The Video Rate is not explicitly configured on NetVX encoders. The Video Rate is determined by the Maximum TS Rate less the various other elements in the stream – as described in Section 17.4, "Overview of the Program Transport Stream Rate" on page 516.
(b) The ENC-H11 does not have a hardware-constrained Maximum Video Rate. The ENC-H11's video rate is constrained by the items described in Note (a) above.
(c) The ENC-S11 and ENC-S21 both have hardware-constrained Maximum Video Rates.

Related Topics

- Section 17.1, "NetVX Backplane Bandwidth Considerations" on page 513
- Section 17.2, "NetVX Module Bandwidth Usage" on page 514
- Section 17.4, "Overview of the Program Transport Stream Rate" on page 516
- Section 17.5, "ATM Standards and Rate Calculations" on page 519

17.4 Overview of the Program Transport Stream Rate

The transport stream bitrate specifies the rate for the entire program. When specifying this rate, the total should be large enough to carry control information and the program components: audio, video, VBI lines, and VANC data. With the exception of video, each of these components has a configuration parameter that specifies or affects its respective rate. The encoder subtracts those explicit or implied rate values from this total transport stream rate and assigns the remaining bandwidth to video.

Rates of the following items are subtracted from the Transport Stream rate in order to determine the Video Rate. Each of the items are described in the sections that follow.

- Section 17.4.1, "Program and System Information" on page 516
- Section 17.4.2, "Separate PID" on page 517
- Section 17.4.3, "Frame Completion" on page 517
- Section 17.4.4, "4:2:2 Coding" on page 517
- Section 17.4.5, "Audio Rate" on page 517
- Section 17.4.6, "VBI lines" on page 517
- Section 17.4.7, "Vertical Ancillary Data" on page 517
- Section 17.4.8, "Safety Factor" on page 517
- Section 17.4.9, "Transport Stream Overhead" on page 518
- After all of the above are subtracted from the TS Rate, only the Video Rate is left. See Section 17.4.10, "Video Rate" on page 518 for more detail.

17.4.1 Program and System Information

Program information includes the PAT (Program Association Table) and PMT (Program Map Table). With the exception of PMTs, each program table occupies 1 transport stream packet. Program tables are repeated at an interval that depends on the SI-PSI mode. ATSC requires additional descriptors for the PMT, making it two packets long instead of one. The System Information (SI) tables have a variable schedule, so the table below reports the aggregate SI bandwidth.

Table 17-4 Program and System Information Table Rates (SI Bandwidth)

SI Mode	Table	Interval (ms)	Bandwidth (bps)		
ATSC	PAT	95	15,832 bps	=	1 * 188 * 8 * 1000 / 95
	PMT	395	7616 bps	=	2 * 188 * 8 * 1000 / 395
	SI	Varied	28,092 bps		Includes tables: STT, MGT, TVCT, EIT-0, EIT-1, EIT-2, and EIT-3.
DVB	PAT	395	3808 bps	=	1 * 188 * 8 * 1000 / 395
	PMT	395	3808 bps	=	1 * 188 * 8 * 1000 / 395
	SI	Varied	6032 bps		includes tables: TSDT, TDT, NIT, SDT, and EIT present/following.
MPEG	PAT	95	15,832 bps	=	1 * 188 * 8 * 1000 / 95
	PMT	395	3808 bps	=	1 * 188 * 8 * 1000 / 395
	SI	1000	1504 bps	=	1 * 188 * 8 * 1000 / 1000, includes the SDT table.

17.4.2 Separate PID

If the program uses a separate PID for PCRs, that PID carries 1 transport stream packet every 30 milliseconds.

```
50133 bps = 1 * 188 * 8 * 1000 /30
```

17.4.3 Frame Completion

Frame completion ensures every frame uses full transport stream packets. Combined with picture headers, this uses one and one half packets per frame.

```
67680 bps = 188 * 8 * 1.5 * 30 fps
```

Note: The rate of 30 frames per second is used in this calculation regardless of the actual frame rate.

This amount includes EIA 708 closed captions for VBI line 21 (captions on other lines are counted in the VBI value, given below), or for closed captions received over UDP, depending on the program's closed caption source. The transport stream carries this data, regardless of whether closed captions are received or not. The data occupy 9600 bps, using 3 bytes for every 2 bytes of payload. Prior to version f.g.a, the frame completion and line 21 closed captions were counted separately, contributing (45120 + 37440) bps.

17.4.4 4:2:2 Coding

If the resolution indicates 4:2:2 coding, and pre-processing is enabled, the stream needs one packet per GOP (group of pictures) for chroma quantizer matrixes. See the "Resolution" control on page 244.

```
matrix_rate = 188 * 8 * (29 + gop_size) / gop_size
```

Note: The rate of 30 frames per second is used for rounding regardless of the actual frame rate.

17.4.5 Audio Rate

The Audio Rate is based on the selected audio coding ‘Standard’ (See the "Standard (audio)" control on page 245) and whether the audio channel is enabled (See the "State" control on page 245).

17.4.6 VBI lines

The amount of data reserved for VBI is based on each line’s function. See the "Function" command on page 289,

17.4.7 Vertical Ancillary Data

The VANC data rate is a configured parameter. The rates associated with these services must reduce the overall transport stream rate. See the "VANC Data Rate (Mbps)" command on page 292,

17.4.8 Safety Factor

A safety factor of 1 transport stream packet per picture adds to the TS Rate.

```
45120 bps = 188 * 8 * 30 fps
```

Note: The rate of 30 frames per second is used for rounding regardless of the actual frame rate.

17.4.9 Transport Stream Overhead

Transport Stream overhead (ts_overhead) is one 4-byte transport stream header added for each 188-byte packet of the remaining rate.

```
ts_overhead = ((remaining_ts_rate + 187) / 188) * 4
```

17.4.10 Video Rate

The final video rate should lie between 100,000 and 50,000,000 bps (inclusive).

17.4.11 StatMux and the Transport Stream Rate

When the encoder participates in a statistical multiplexing group, its transport stream rate can vary dynamically. Without statmux, the configured transport stream rate is the maximum stream rate. In a statmux group, however, the configured value is taken to be the average stream rate. The statmux controller allocates the group's bandwidth as needed, and the dynamic rate for any encoder can exceed its configured transport stream rate.

Normally, one would not connect a statistically multiplexed encoder to multiple destinations, because of the relaxed constraints on the encoder's output rate. It can be done, but the receivers should be prepared for a rate that varies more widely than a non-multiplexed stream. When multiple connections exist, no more than one can activate dynamic rate control in a statmux group. If multiple connections attempt to enable statmux, the encoder will assert an alarm (modDeg, configuration error).

Related Topics

- Section 17.1, "NetVX Backplane Bandwidth Considerations" on page 513
- Section 17.2, "NetVX Module Bandwidth Usage" on page 514
- Section 17.3, "Range of NetVX Encoder Rates" on page 515
- Section 17.5, "ATM Standards and Rate Calculations" on page 519

17.5 ATM Standards and Rate Calculations

The following table provides a listing of each of the NetVX's ATM interface standards, maximum rate, and supporting rate calculations. The 'Standard' column lists each selection available under the 'cfg slot.s/atm/ifc.m standard' command.

Table 17-5 Maximum ATM Transmits Rates Based on Standard

Standard	Maximum ATM Rate (Mbps)	Notes and Calculations
ds3-cbit-adm	44.209694	The raw DS3 interface carries 44.736 Mbps. C-bit ATM-Direct-Map carries 680-bit frames with 672 payload bits/ frame. 44.209694 = 44.736 * 672 / 680
ds3-cbit-plcp	40.704	The raw DS3 interface carries 44.736 Mbps. C-bit PLCP carries 8000 frames per second, each with 12 ATM cells. 40.704 = 8000 * 12 * 53 * 8
ds3-m23-adm	44.209694	The raw DS3 interface carries 44.736 Mbps. M23 ATM-Direct-Map carries 680-bit frames with 672 payload bits/ frame. 44.209694 = 44.736 * 672 / 680
ds3-m23-plcp	40.704	The raw DS3 interface carries 44.736 Mbps. M23 PLCP carries 8000 frames per second, each with 12 ATM cells. 40.704 = 8000 * 12 * 53 * 8
e3-751-adm	33.792	G.751 ATM-Direct-Map carries four 8.448 Mbps tributaries. 33.792 = 4 * 8.448
e3-751-plcp	30.528	G.751 PLCP carries 8000 frames per second; each frame has 9 ATM cells. 30.528 Mbps = 8000 * 9 * 53 * 8
e3-832-adm	33.920	G.852 ATM-Direct-Map carries 8000 frames per second, each with 10 ATM cells. 33.920 = 8000 * 10 * 53 * 8
SDH, SONET	149.760	The raw OC-3 interface carries 155.520 Mbps. SONET and SDH use 270-byte lines carrying 260 bytes of payload. 149.760 = 155.520 * 260 / 270

Related Topics

- Section 17.1, "NetVX Backplane Bandwidth Considerations" on page 513
- Section 17.2, "NetVX Module Bandwidth Usage" on page 514
- Section 17.3, "Range of NetVX Encoder Rates" on page 515
- Section 17.4, "Overview of the Program Transport Stream Rate" on page 516

Volume 3: FlexiCoder™ Digital Video System

Chapter 18: Configuration Display 18

18.1 FlexiCoder™ DVS Configuration Display

Abstract: *The configuration display provides access to all FlexiCoder™ DVS configuration dialogs, and configuration parameters.*

18.1.1 FlexiCoder™ DVS Navigation Tree

The navigation tree, on the left of the screen, provides persistent display of the FlexiCoder™ Digital Video System configuration hierarchy.

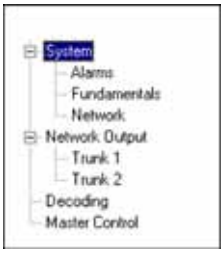


Figure 18-1 FlexiCoder™ DVS Navigation Tree

The current location within the hierarchy is always highlighted. Click on branches in the Navigation Pane to expand or to hide detail, and to move rapidly from one location in the hierarchy to another.

18.1.2 FlexiCoder™ DVS Composite Configuration Display

The FlexiCoder™ DVS Composite Configuration display indicates the type, location, and the operational state of modules in the FlexiCoder™ DVS. Toggle the radio buttons at the top of this view to display either front modules or rear I/O cards.

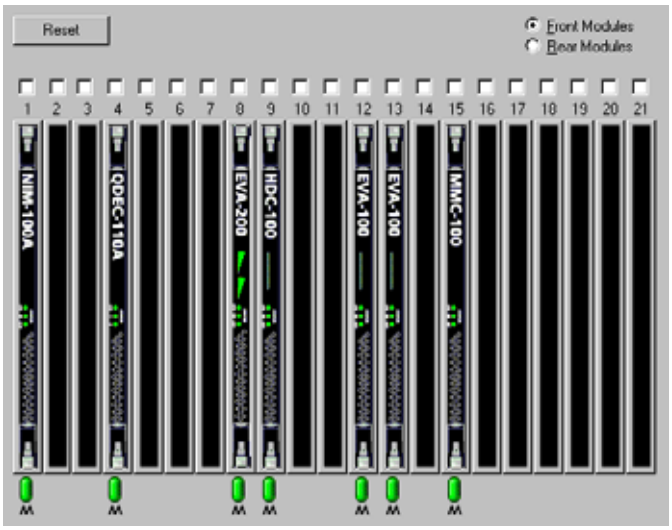


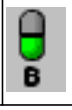
Figure 18-2 Module Configuration Display

18.1.3 FlexiCoder™ DVS Module State Icons

The following module state icons appear adjacent to each module image.

Note: The icon orientation is different for each type of system.

Table 18-1 Vidiem™ Module State Icons

WS5	WS21	Meaning
		Indicates the module is operating as a main module.
		Indicates the module is operating as a backup module.

18.1.4 FlexiCoder™ DVS Configuration Tables

Configuration tables display parameter names and settings. Double-click any row to open the respective Configuration Dialog.

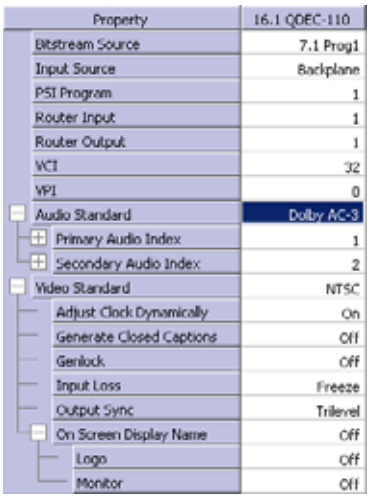


Figure 18-3 A FlexiCoder™ DVS Configuration Table

Chapter 19: FlexiCoder™ DVS Status Monitoring 19

19.1 Overview of FlexiCoder™ DVS Status Monitoring

Vidiem™'s Status Document Window provides real-time status monitoring of any registered device. This window is divided into two parts, (a) the status tree, and (b) the status display.

- Click in (a) the "FlexiCoder™ DVS Status Navigation Tree" on page 527 in the left pane to view status tables.
- Use (b), the "FlexiCoder™ DVS Status Display" on page 528 to view a depiction of the system state and LED status.

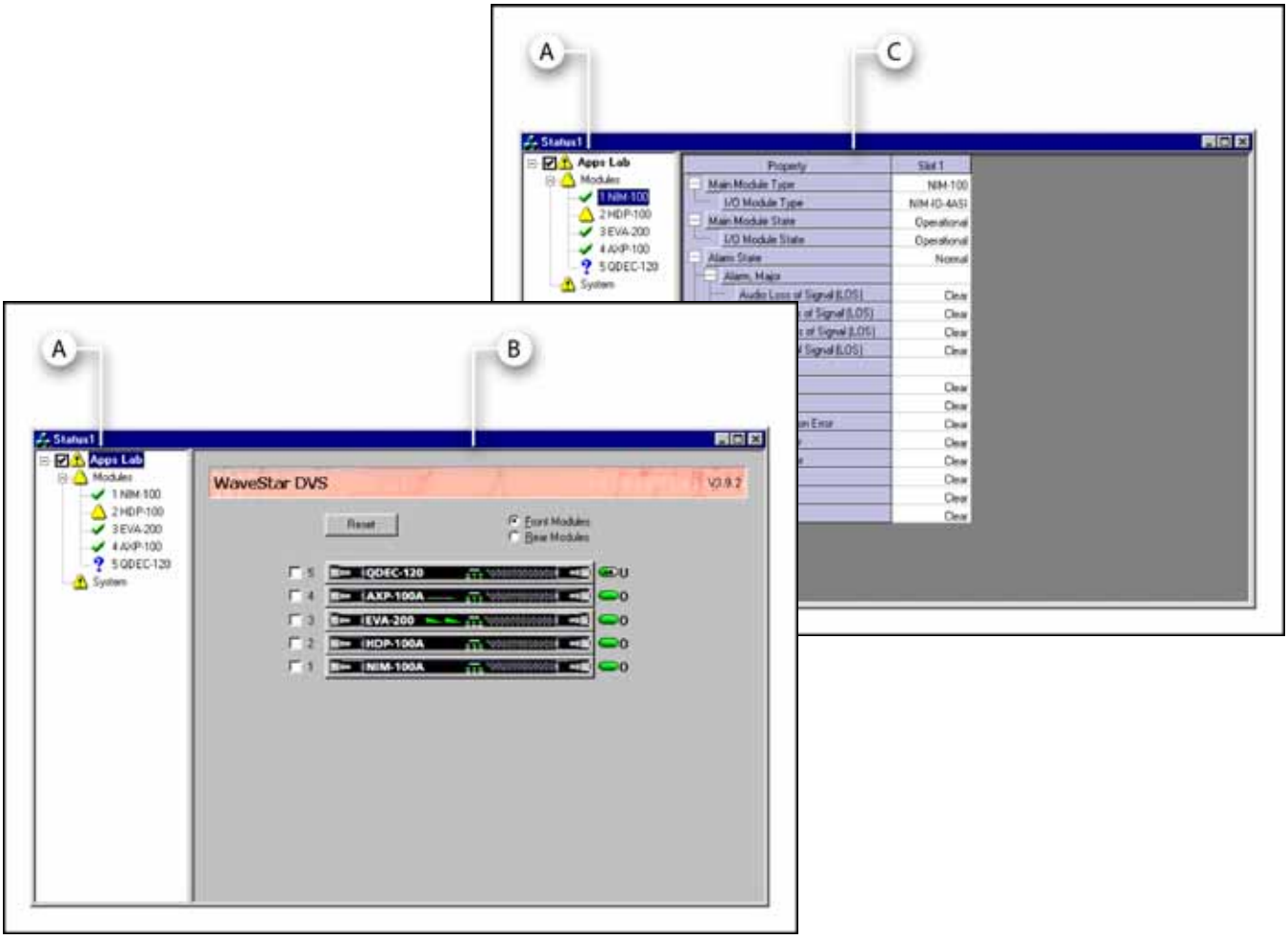


Figure 19-1 FlexiCoder™ DVS Status Window Displays

- Status tables (C) provide a listing of parameters related to each branch. Highlight any status table and press F1 for a description of the items in that table.

19.2 Status Monitoring Procedures

19.2.1 How to Monitor FlexiCoder™ DVS Status

Use the following steps to monitor a FlexiCoder™ DVS using Vidiem™.

1. Open the device that you want to monitor by selecting select 'Device > Open' from the menubar.
2. Highlight the device in the device list and press 'OK'.
3. Choose 'View > Status' to open the Status Document Window.
4. In the Navigation Pane on the left side of the Status Document Window, place a check mark in the box next to the device to monitor (location A in Figure 19-1 on page 525).

Active devices appear checked with their name in bold letters, as the FlexiCoder™ DVS (C). Vidiem™ polls these devices for status at a user-specified Status Polling Interval.

19.2.2 How to Save Status Parameters to a File

Abstract: *Use this procedure to save FlexiCoder™ DVS status parameters to a file. The resulting file captures the state of all status parameters on all FlexiCoder™ DVS systems listed in the status display at the time the file was saved.*

1. Choose 'View > Status' from the menubar to open the status view.
2. Choose 'File > Save As', then select a file location, enter a filename and press 'Enter' to save the file.

19.3 FlexiCoder™ DVS Status Display Details

19.3.1 FlexiCoder™ DVS Status Navigation Tree

The status display provides a navigation tree populated with one main branch for each piece of equipment listed in the Devices Dialog. When monitoring a FlexiCoder™ DVS, the alarm status icon (B) next to each device name indicates the highest severity alarm affecting the respective device.

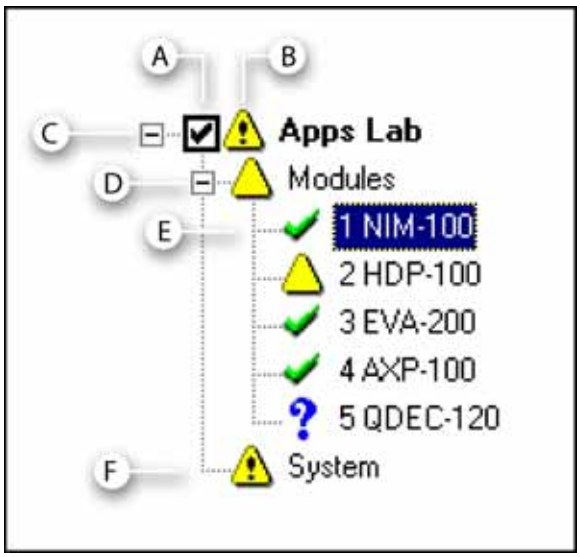


Figure 19-2 The FlexiCoder™ DVS Branch of the Status Tree

Status icons at each level of the tree (D, E, and F) indicate the highest alarm severity level asserted by underlying branches.

19.3.2 FlexiCoder™ DVS Status Navigation Tree Icons

The Status Navigation tree displays the following Alarm Status Icons. Icons are listed by severity level ranging from most to least severe.

Icon	Icon Meaning
	Indicates the device or module reports at least one critical error.
	Indicates the device or module reports at least one major error.
	Indicates the device or module reports at least one minor error.
	Indicates the device or module provided a warning message.
	Indicates the device or module did not report any errors.
	Indicates Vidiem™ cannot display status for this device or module.

19.3.3 FlexiCoder™ DVS Status Display

The Status Display provides a composite, graphical representation of the FlexiCoder™ DVS.

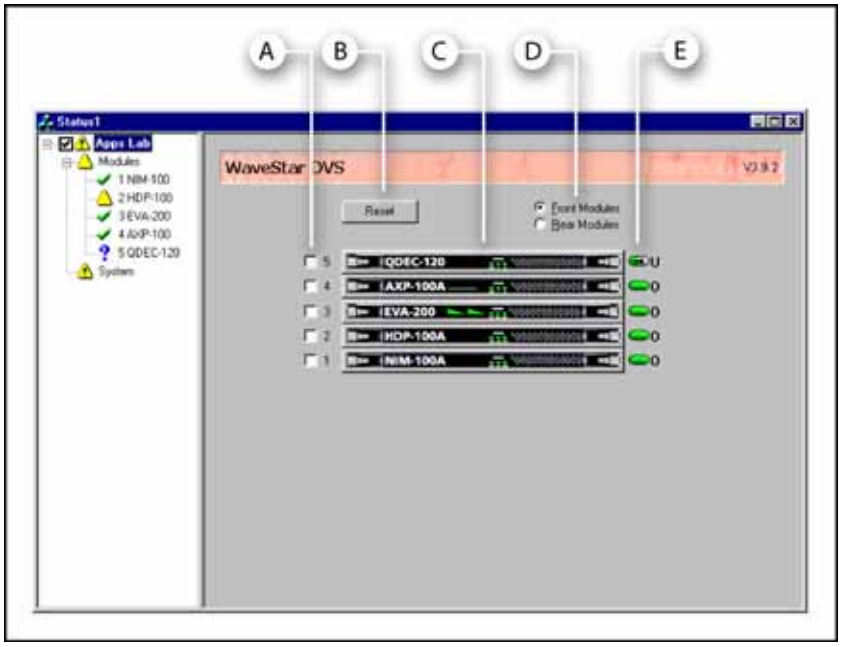


Figure 19-3 FlexiCoder™ DVS Status Display - WS-5

Vidiem™ monitors and updates each of the following items every time it polls the system.

A Module Check Boxes Select boxes and press the Reset Button (B) to reset selected modules.

B Reset Button (described above).

C Module Icons Click the NIM module icon to access dialogs for setting the time and date. Click the application module dialogs to access the 'Transfer Service' dialog.

D Radio Buttons Controls whether this display shows application modules or I/O cards.

E Module State Icons See "FlexiCoder™ DVS Module State Icons" on page 529 for details.

19.3.4 FlexiCoder™ DVS Module State Icons

Module state icons are displayed adjacent to each module image. The following table provides a legend of these states.

Table 19-1 WS5 and WS21 Module State Icons

WS5	WS21	(Icon orientation varies between the WS5 and the WS21)
		Indicates the module is operational.
		Indicates the module is initializing.
		Indicates the module is performing In System Programming (ISP).
		Indicates the module's firmware is upgrading.
		Indicates the module is off.
		Indicates the module is re-configuring.
		Indicates the module is performing a self-test.
		Indicates the module state is unknown.

19.4 Status > Modules

Abstract: *This branch of the status tree indicates FlexiCoder™ DVS module status.*

- When the 'Modules' branch of the status tree is selected, the following fields are displayed for all slots.
- When a single slot/module is selected in the status tree, the following fields are displayed only for the selected slot.

19.4.1 Main Module Type

Indicates the type of module installed in the selected slot.

I/O Module Type

Indicates the type of I/O module installed opposite the main module in the selected slot.

19.4.2 Main Module State

I/O Module State

Indicates the state of I/O module installed opposite the main module in the selected slot.

19.4.3 Alarm State

This section indicates the state (either 'Raised' or 'Clear') of each type of DVS alarm. The 'Raised' indication signifies 'at least one' of the specified alarms is active.

Alarm, Major

Audio Loss of Signal (LOS)

Indicates if the module is experiencing an Audio LOS.

Decode Loss of Signal (LOS)

Indicates if the module is experiencing a Decode LOS.

Genlock Loss of Signal (LOS)

Indicates if the module is experiencing a Decode LOS.

Video Loss of Signal (LOS)

Indicates if the module is experiencing a Video LOS.

Alarm, Minor

Audio Error

Indicates if the module is experiencing an Audio Error.

Bandwidth

Indicates if the module is experiencing a Bandwidth Error.

Closed Caption Error

Indicates if the module is experiencing a Closed Caption Error.

Decode Error

Indicates if the module is experiencing a Decode Error.

Genlock Error
Indicates if the module is experiencing a Genlock Error.

Module Error
Indicates if the module is experiencing an error.

System Error
Indicates if the module is experiencing a System Error.

Video Error
Indicates if the module is experiencing a Video Error.

19.5 Status > System

19.5.1 Status > System > Summary Tab

Severity

Alarms: Critical, Informative, Major, Minor

This field indicates whether any of these alarms have been raised.

Equipment Errors

ATM Error

This alarm indicates an ATM layer protocol error is detected (e.g. CRC error, loss of ATM cell delineation).

ATM Output Error

This alarm indicates the system is receiving ATM cells but is not transmitting them. (This may be a normal condition if the system contains only decoders).

Bandwidth

This alarm indicates the provisioned bandwidth is exceeded for imported programs.

Fan Failure

This alarm indicates a fan failure.

NIM Error

This alarm indicates the NIM CPU is unable to transmit data on the system backplane.

This alarm is most likely occur when the system is configured to operate in transport mode with an I/O board, and there is not an I/O board behind the NIM module. This alarm may also occur when a NIM I/O board is initializing.

Power Failure

This alarm is raised when a power supply failure is detected.

System Error

This alarm is raised when a network related error is detected that indicates some system processing error.

Time Error

This alarm is issued when the time server is unreachable.

Link Errors

Link AIS

This alarm indicates a remote Alarm Indicator State (AIS) is reported on whichever of the OC3, DS3A, or DS3B connections is configured for ATM input. This alarm state is provided by 'downstream' equipment receiving signals from this equipment and indicates transmission is being interrupted.

Bit Error

This alarm indicates an importer board detects bit errors in an incoming transport stream.

Link LOS

This alarm indicates a Loss Of Signal (LOS) is detected on whichever of the OC3, DS3A, DS3B, E3, STM1e, or STM-1o connections is configured for ATM input.

Link RDI

This alarm indicates a Remote Defect Indication (RDI) is reported on whichever of the OC3, DS3A, or DS3B connections is configured for ATM input This alarm indicates errors in 'upstream' equipment sending signals to this system.

19.5.2 Status > System > PDH Tab

Equipment Errors

ATM Error

ATM Error: DS3 Cell Loss

Provides a count of DS3 cells lost.

ATM Error: DS3 Uncorrectable HEC Errors

Provides a count of the number of ATM cells containing header errors that are in excess of the number of cells that HEC could fix.

ATM Output Error

ATM Output Error: Cells Received

Provides a count of errored ATM cells received.

ATM Output Error: Cells Sent

Provides a count of errored ATM cells sent.

Bandwidth: Multiplex FIFO Overflow

Indicates when the FIFO multiplex overflows. This error indicates insufficient bandwidth available on the network connection to carry the multiplex.

Bandwidth: DS3 Receive FIFO Overflow

Indicates more data is being sent to the DS3 receiver, from an external device, than the interface can process; the result is lost data.

NIM Error: DS3 Transmit FIFO Overflow

Indicates more data is being sent to the DS3 transmit interface than the interface can transmit.

Link Errors

Link AIS: Line AIS State

Indicates to the receiving FlexiCoder™ DVS when a line Alarm Indication Signal (AIS) occurs. A '1' indicates an active alarm state. The line AIS is triggered when the immediate upstream link to this FlexiCoder™ DVS is jeopardized.

Link AIS: Path AIS State

Indicates to the receiving FlexiCoder™ DVS when a path Alarm Indication Signal (AIS) occurs. A '1' indicates an active alarm state. The path AIS is triggered when any upstream link to this FlexiCoder™ DVS is jeopardized.

Bit Error: Line BIP-8 Errors

Indicates the number of line BIP-8 errors detected on the DS3 connection since the last system reset.

Bit Error: Path BIP-8 Errors
Indicates the number of path BIP-8 errors detected on the DS3 connection since the last system reset.

Bit Error: Section BIP-8 Errors
Indicates the number of section BIP-8 errors detected on the DS3 connection since the last system reset.

Link LOS: LOF State
Indicates the current Loss of Frame (LOF) state on the DS-3 connection. A '1' indicates an active alarm state.

Link LOS: LOP State
Indicates the current Loss of Pointer (LOP) state on the DS-3 connection. A '1' indicates an active alarm state.

Link LOS: LOS State
Indicates the current Loss of Pointer (LOP) state on the DS-3 connection. A '1' indicates an active alarm state.

Link RDI: Line RDI State
Indicates to the transmitting FlexiCoder™ DVS that a line Alarm Indication Signal (AIS) has occurred. A '1' indicates an active alarm state.

Link RDI: Path RDI State
Indicates to the transmitting FlexiCoder™ DVS that a path Alarm Indication Signal (AIS) has occurred. A '1' indicates an active alarm state.

19.5.3 Status > System > SONET/SDH Tab

Equipment Errors

ATM Error: OC3 Cell Loss
Provides a count of OC3 cells lost.

ATM Error: HEC Count
Provides a count of the number of ATM cells containing header errors that are in excess of the number of cells that HEC could fix.

ATM Output Error: Cells Received
Provides a count of errored ATM cells received.

ATM Output Error: Cells Sent
Provides a count of errored ATM cells sent.

Bandwidth: Multiplex FIFO Overflow
Indicates when the FIFO multiplex overflows. This error suggests that the network connection has insufficient bandwidth available to carry the multiplex.

Bandwidth: Receive FIFO Overflow
Indicates more data is being sent to the OC3 receiver, from an external device, than the interface can process; the result is lost data.

NIM Error: Transmit FIFO Overflow
Indicates more data is being sent to the OC3 transmit interface than the interface can transmit.

System Error: Transmit Parity
Indicate parity errors on the transmit interface.

Link Errors

Link AIS: Line AIS State

Indicates to the receiving FlexiCoder™ DVS when a line Alarm Indication Signal (AIS) occurs. A '1' indicates an active alarm state. The line AIS is triggered when the immediate upstream link to this FlexiCoder™ DVS is jeopardized.

Link AIS: Path AIS State

Indicates to the receiving FlexiCoder™ DVS when a path Alarm Indication Signal (AIS) occurs. A '1' indicates an active alarm state. The path AIS is triggered when any upstream link to this FlexiCoder™ DVS is jeopardized.

Bit Error: Line BIP-8 Errors

Indicates the number of line BIP-8 errors detected on the DS3 connection since the last system reset.

Bit Error: Path BIP-8 Errors

Indicates the number of path BIP-8 errors detected on the DS3 connection since the last system reset.

Bit Error: Section BIP-8 Errors

Indicates the number of section BIP-8 errors detected on the DS3 connection since the last system reset.

Link LOS: LOF State

Indicates the current Loss of Frame (LOF) state on the DS-3 connection. A '1' indicates an active alarm state.

Link LOS: LOP State

Indicates the current Loss of Pointer (LOP) state on the DS-3 connection. A '1' indicates an active alarm state.

Link LOS: LOS State

Indicates the current Loss of Pointer (LOP) state on the DS-3 connection. A '1' indicates an active alarm state.

Link RDI: Line RDI State

Indicates to the transmitting FlexiCoder™ DVS that a line Alarm Indication Signal (AIS) has occurred. A '1' indicates an active alarm state.

Link RDI: Path RDI State

Indicates to the transmitting FlexiCoder™ DVS that a path Alarm Indication Signal (AIS) has occurred. A '1' indicates an active alarm state.

Chapter 20: FlexiCoder™ DVS Alarms

20

20.1 Overview of FlexiCoder™ DVS Alarms

The FlexiCoder™ DVS provides three alarm indicators for each alarm type.

- LEDs located on the faceplate of each module.
- Contact closures through the NIM-IO card's ALARM interface.
- SNMP traps sent to Vidiem™'s Trap Log. See "Vidiem™ Trap Log and SNMP Communication" on page 58 for details.

The system's Alarm Indicators are governed by Alarm Thresholds, and Alarm Persistence settings. The following diagram displays the timing and relationship between the FlexiCoder™ DVS's various Alarm Thresholds, Alarm Indicators, and Alarm Persistence settings.

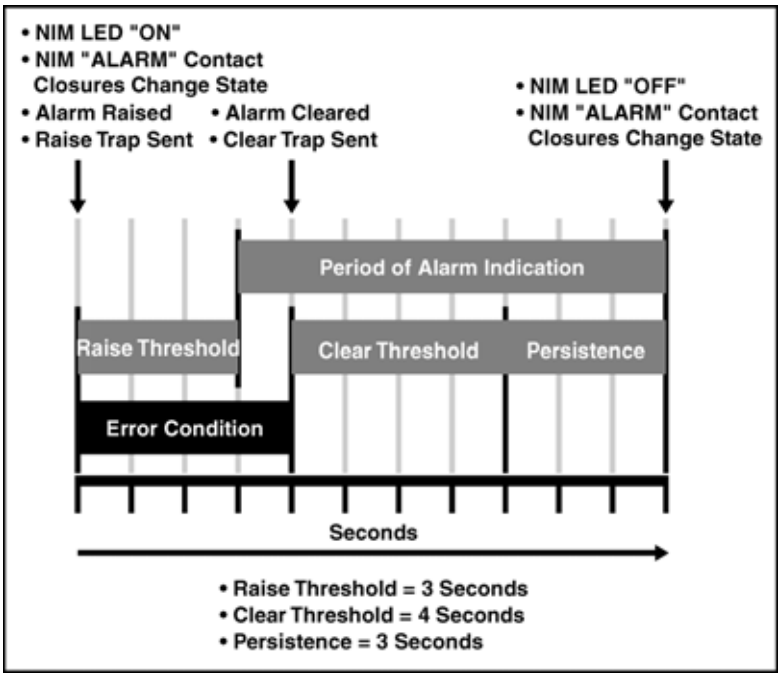


Figure 20-1 FlexiCoder™ DVS Alarm Signaling Timeline

20.1.1 Overview of Alarm Thresholds

Each FlexiCoder™ DVS alarm has two thresholds.

- Raise Threshold – This setting specifies the number of consecutive seconds in which an error condition must be detected before an alarm state is reached and an indicator is activated.
- Clear Threshold – This setting specifies the number of consecutive seconds in which an error condition must not be detected before the system clears the associated alarm state.

20.1.2 Overview of Alarm Severity

Each FlexiCoder™ DVS alarm is assigned a fixed severity level. All alarms are either:

- Critical Alarms
- Major/Minor Alarms

20.1.3 Overview of Alarm Persistence

The FlexiCoder™ DVS's alarm persistence settings specify how long alarm indicators should remain active following the end of the Clear Threshold. The persistence for each FlexiCoder™ DVS is assigned by severity level. The two choices for *alarm persistence* are:

- Manual Reset – The alarm indicator does not shut off after the Clear threshold is reached. Rather, user intervention is required.
- Automatic Reset – Specifies the number of seconds after the Clear threshold is reached, that the system should maintain the NIM LED, and ALARM contact indicators.

Note: The FlexiCoder™ DVS's Installation and Operation manual that was shipped with your system provides a pinout the NIM's I/O card's ALARM connection, and descriptions of the LED alarm indicators on the faceplate of each main module.

20.2 Alarm Configuration Dialogs

20.2.1 Config > System > Alarm Persistence

Critical

A critical alarm indicates a network-affecting condition that could propagate or affect other systems on the network. The persistence value specifies how long critical alarms should remain active after the clear threshold is reached.

Manual Reset No automatic clear; requires a manual reset of all critical alarms.

Automatic Reset Sets the number of seconds the critical alarm indicator remains active following the end of the Clear threshold.

Major and Minor

A major/minor alarm indicates a service-affecting condition. The persistence value specifies how long a major/minor alarm should remain active after the clear threshold is reached.

Manual Reset No automatic clear; requires a manual reset of all major/minor alarms.

Automatic Reset Sets the number of seconds the major/minor alarm indicator remains active following the end of the Clear threshold.

20.2.2 Config > System > Alarms > Equipment Error Thresholds

Each alarm type has a raise and a clear value associated with it.

Raise Values indicate the number of consecutive seconds in which an error condition must be detected before an alarm is raised and a trap is sent.

Clear Values indicate the number of consecutive seconds in which an error condition must not be detected before the system clears an alarm and sends an alarm clear trap.

The valid values for the raise and clear thresholds are:

0 (sec) Raise: The system will not raise an alarm.
Clear: The system will not automatically clear the alarm condition. The alarm must be cleared manually

1 (sec) Raise or clear an alarm immediately.

2-3600 (sec) Number of seconds before reaching the raise or clear threshold.

The following controls set the raise or clear threshold values, in seconds, for the specified alarm.

ATM Error

Minor alarm - Indicates that an ATM layer protocol error has been detected.

ATM Output Error

Critical alarm - Indicates that a FlexiCoder™ DVS functioning in ATM mode is receiving ATM cells, but it is not transmitting cells back to the network.

Bandwidth

Critical alarm - Indicates an error has been detected which indicates too much traffic competing for the outgoing ATM interface.

Fan Fail

Major alarm - Indicates one of the unit's internal fans has stopped functioning.

NIM Error

Critical alarm – Indicates a FIFO overflow error has been detected that indicates a NIM module processing error.

Power Fail

Major alarm – Indicates a redundant power supply voltage has dropped too low.

System Error

Minor alarm – Indicates a network error involving system processing.

Use Defaults (button)

Press this button to populate all the fields in this dialog with the default value “5” seconds.

20.2.3 Config > System > Alarms > Link Error Thresholds

Each alarm type has a raise and a clear value associated with it.

Raise Values indicate the number of consecutive seconds in which an error condition must be detected before an alarm is raised and a trap is sent.

Clear Values indicate the number of consecutive seconds in which an error condition must not be detected before the system clears an alarm and sends an alarm clear trap.

The valid values for the raise and clear thresholds are:

0 (sec) Raise: The system will not raise an alarm.
Clear: The system will not automatically clear the alarm condition. The alarm must be cleared manually

1 (sec) Raise or clear an alarm immediately.

2-3600 (sec) Number of seconds before reaching the raise or clear threshold.

The following controls set the raise or clear threshold values, in seconds, for the specified alarm.

Alarm Indication Signal (AIS)

Indicates a remote Alarm Indicator State (AIS) has been received on the ATM input connection. This often means that a piece of 'upstream' ATM equipment has failed.

Bit Error

Indicates an ATM frame parity error has been reported on the ATM input connection.

Loss of Signal (LOS)

Indicates a Loss of Signal (LOS) or Loss of Framing (LOF) error has occurred on the ATM input connection (i.e. no bits are detected).

Remote Defect Indicator (RDI)

Indicates a Remote Defect Indication (RDI) has been reported on the ATM input connection.

Use Defaults (button)

Press this button to populate all the fields in this dialog with the default value '5' seconds.

20.2.4 Config > System > Alarms > Module Errors

Each alarm type has a raise and a clear value associated with it.

Raise Values indicate the number of consecutive seconds in which an error condition must be detected before an alarm is raised and a trap is sent.

Clear Values indicate the number of consecutive seconds in which an error condition must not be detected before the system clears an alarm and sends an alarm clear trap.

The valid values for the raise and clear thresholds are:

0 (sec) Raise: The system will not raise an alarm.
Clear: The system will not automatically clear the alarm condition. The alarm must be cleared manually

1 (sec) Raise or clear an alarm immediately.

2-3600 (sec) Number of seconds before reaching the raise or clear threshold.

The following controls set the raise or clear threshold values, in seconds, for the specified alarm.

Audio Error

This trap is issued when the system detects a bad audio signal to an encoder.

Note: The system can detect this condition only for digital input.

Audio Loss of Signal (LOS)

Indicates a Loss of Signal error has been reported on an audio input connection.

Video Error

Indicates that the system detected a 'bad' video signal to an encoder. In this context, 'Bad' means that the signal is not framed correctly, or that it has data errors.

Video Loss of Signal (LOS)

Indicates that the system detected a loss of video signal to an encoder.

Use Defaults (button)

Press this button to populate all the fields in this dialog with the default value '5' seconds.

Chapter 21: FlexiCoder™ DVS Encoder Module 21

21.1 Encoder Procedures

21.1.1 How to Create a FlexiCoder™ DVS Encoding Session

1. Click on 'System' in the navigation pane.
2. Open the 'Channels' tab.
3. Highlight an encoder channel. To highlight the encoder channel, click and hold the mouse button somewhere in the row.
4. Drag the highlighted channel over the Trunk option of the navigation pane so that Trunk becomes highlighted. Drop the encoder channel. The Encoder Wizard opens.
5. Follow the Wizard instructions. The encoder channel becomes listed as an encoding session under Trunk in the navigation tree.
6. Click the 'Write Device' icon on the menu bar.

Note: Double-click on the name of the encoding session in the navigation pane to access the 'Encoder Properties' dialog box and to further configure the encoding session.

21.1.2 How to Add an Associated FlexiCoder™ DVS Audio Channel to an Encoding Session

1. Create an encoding session as described in "How to Create a FlexiCoder™ DVS Encoding Session" on page 543.
2. Click on 'System' in the navigation pane.
3. Open the 'Channels' tab.
4. Highlight an audio channel. To highlight the audio channel, click and hold the mouse button somewhere in the row.
5. Drag the highlighted channel over one of the encoding sessions in the Trunk option of the navigation pane so that Trunk becomes highlighted.
6. Drop the audio channel. The audio channel is now associated with that encoding session.
7. Click the 'Write Device' icon on the menu bar.

Note: To configure the associated audio channel, double-click on the audio channel in the navigation pane. The 'Encoder Properties' dialog box opens. Click on the 'SLOT # AUDIO' in the navigation pane that corresponds to the audio channel you just added and configure the audio properties.

21.1.3 How to Delete a FlexiCoder™ DVS Encoding Session

1. Expand the 'Trunk' branch, containing the encoding session, in the navigation tree.
2. Right-click on the name of the encoding session in the navigation tree.
3. Select 'Delete' from the menu.
4. Click the 'Write Device' icon on the menu bar.

21.2 Encoder Module Configuration

Name

Specify a name for the program that you are adding.

The specified name will identify the program in the configuration tree under the chosen trunk.

Video

Specify the Video Standard and Profile of the material this program will encode. Select 'Broadcast' for 4:2:0 material. Select 'Professional Video Networking' for 4:2:2 material.

Audio

Specify the audio encoder that this program should use.

Bitrate

Specify the total bit rate that the system should allot to this program. If you wish to use the FlexiCoder™ DVS's setups feature, you can specify one set up for this program now.

21.2.1 Config > Trunk # > Program # > Video > Video Properties Dialog

Standard, Resolution

These controls set the video standard and resolution. The 'standard' selection limits the range of 'resolution' settings to legal values.

Note: The video pre-filter (located in the 'Input Video Preprocessing Properties' dialog) must be turned OFF before changing the encoding standard from NTSC to PAL when using either the EVA-100 or the EVA-110 encoder.

Bitrate

Sets the maximum bit rate of the encoded video component of the bit stream in bits per second (bps).

If the 'Total Rate' for the program is changed in the 'Program Output Properties' dialog, then this setting is automatically changed to indicate the maximum computed bitrate available for video in this program. This rate is calculated by subtracting all the programs fixed-rate items (audio, data, teletext, etc.) from the 'Total Bitrate' assigned to this program.

You can also use this control to lower the maximum video bitrate to a value below that of the calculation described above.

Input Source

Identifies the input video signal as either analog composite or serial digital.

Note: This control is only applicable to EVA-100 and EVA-110 encoders.

Vertical Adjustment

Specifies the line on which MPEG-2 encoding should begin. This command is provided to achieve compatibility with different vendor's decoder implementations. This setting is used only in 240 and 480 line modes.

0 Indicates that coding should begin on field 1, line 21. Use this value in end to end systems using QDEC decoders.

1 Indicates that coding should begin on field 1, line 22.

21.2.2 Config > Trunk # > Program # > Video > Input Video Processing Properties Dialog

Filter

Chroma Filter Format

Sets the chroma decimation filter format. This selection affects the algorithm used to convert from 4:2:2 chroma to 4:2:0 chroma.

Adaptive The encoder adapts to the format (interlaced or progressive) of incoming video.

Interlaced Used for coding most video.

Progressive Used for coding progressive materials such as still images and animation.

Comb Filter

Use this control to specify the type of filtering to apply to incoming analog video.

OFF Applies a band splitter filter.

Field Applies a field-based comb filter.

Line Applies a line-based comb filter.

Enable Median Filter

If enabled, this filters out high-frequency 'speckle' noise. Use this filter only if the video source is particularly noisy.

Note: This control is only applicable to EVA-100 and EVA-110 encoders.

Prefilter

Use this control to specify the level of noise reduction applied by the pre-filter.

Adaptive The pre-filter adjusts automatically based on picture complexity.

Off Noise reduction is not applied.

Fixed Level 2-7 Applies fixed noise reduction. 'Fixed Level 7' applies the most noise reduction and greatest picture softening.

Note: The video pre-filter must be turned OFF before changing the encoding standard from NTSC to PAL when using either the EVA-100 or the EVA-110 encoder.

Processing

Film Detect (checkbox)

Enables or disables inverse 3:2 pull down encoding.

Film Detect (selections)

Bias to Video Input Bias the system's detection logic in favor of 30 fps. video.

Bias to Film Input Bias the system's detection logic in favor of 24 fps. film or telecine material.

Lock to Film Input Force to code at 24 frames per second. This selection may cause video artifacts.

Low Delay Encoding (checkbox)

This feature provides a mode for low delay HDTV encoding required for video conferences. This feature is available only on the HDP-100.

21.2.3 Config > Trunk # > Program # > Video > MPEG-2 Video Processing Properties Dialog

Alternate Scanning Order

Toggles the MPEG alternate scan.

This feature changes the order in which DCT coefficients are run-length coded and can improve performance with interlaced material.

Chroma Format

Specifies the chroma format used in the MPEG-2 compression algorithm.

4:2:0 Used for compatibility with main-level@main-profile.

4:2:2 Used for compatibility with main-level@professional-profile.

Concealment Motion Vectors

Toggles the inclusion of motion vectors in I-frames.

This feature can improve picture quality under high transmission error conditions at the expense of picture quality when there are no errors. This parameter is normally set to 'OFF'.

Custom Quantization Matrix

This control enables or disables the customized quantization matrix used to improve picture quality.

Intra-DC Precision

This control specifies the MPEG Intra DC precision value. This parameter is normally set to '8'. Setting this parameter to a larger value can improve picture quality at higher bit rates.

Use MPEG-2 Intra-VLC Format

This control selects the Intra-Variable Length Coding format used to encode intra macro blocks.

Checked Uses MPEG-2-optimized lookup table which is appropriate for interlaced video.

Unchecked Uses MPEG-1-optimized lookup table which is appropriate for progressively scanned video.

Manual Minimum Quantizer

Sets the minimum quantization level used for video encoding.

0 Automatic

1-112 Use of lower values will result in a better quality picture. Higher values result in a lower quality picture.

Manual VBV Buffer Size

This control sets the encoders video buffer verifier (VBV) size.

Lower settings than those specified by the MPEG-2 standard decrease the end to end (encode to decode) delay at the expense of video quality.

Note: The 1000 size is provided to support low-delay mode. This setting may produce unacceptable results with some video content.

21.2.4 Config > Trunk # > Program # > Video > MPEG-2 Structure Properties Dialog

Stream

Aspect Ratio

This control sets a flag in the transport stream indicating the aspect ratio of the video input. The actual video is not changed in any way.

PES Interval (ms)

This control sets the time interval between successive video Program Elementary Stream (PES) headers in milliseconds. For MPEG-2 compliance, this parameter must be set less than or equal to 700.

All Pictures Disables PES header generation.

Only I-Frames This selection forces a PES header to be sent preceding every intra-frame (I-frame). The result is a decrease in channel change time on many decoders.

Note: The 'Only I-Frames' option is only applicable to EVA-100 and EVA-110 encoders.

Fixed Interval This selection sends a PES header at the specified interval, but not more often than once per video frame.

GOP

Close All GOPs (checkbox)

This control allows each group of pictures (GOP) to be decoded individually at a cost to picture quality. This control also affects the allowable values for I-frame spacing (below).

Checked Forces the I-frame spacing to a multiple of the P-frame spacing +1.

Not Checked Forces the I-frame spacing to a multiple of P-frame spacing.

Enable Dynamic GOPs (checkbox)

This control enables the dynamic group of pictures (GOP) function.

Note: 'Dynamic GOP' is only applicable to EVA-100 and EVA-110 encoders.

The dynamic GOP feature allows the encoder to allocate bits in a manner that more closely correlates to picture complexity. This is done by arranging I-frames within the GOP to align at the beginning of scene changes.

Number of B-Frames

Use this control to specify the number of successive B-frames. The range for this control is 0 to 3.

I-Frame Spacing

Use this control to specify the spacing (in frames) between successive I-frames. The range for this control is 1 to 255.

Note: The B-frame and I-frame values have inter-dependencies, see the MPEG-2 Standard (ISO/IEC 13818 Information Technology – Generic coding of moving pictures and associated audio information) for a detailed description.

21.2.5 Config > Trunk # > Program # > Teletext/Data Properties Dialog

Ancillary Data

Bitrate (bps)

Use this control to specify the maximum bitrate that the system can use for Teletext data.

Closed Captions

Input Source

Specifies the encoder's closed captions data source.

Ancillary Data CC data is extracted from SMPTE 292 ancillary data (HDP-100 only).

Serial Port CC data is supplied by an external source. On the HDP-100 this source is the 'CC/LTC' serial port. On the EVA-200 series this source is the 'Data' serial port.

Note: Choosing 'Serial Port' sets the Serial Application in the 'Serial Properties' dialog to 'Captions'.

Video CC data is extracted from line 21 of the video signal.

Enable Output

If checked, enables closed caption information transmission.

(options)

Use this control to specify the format type used to encode closed caption information in picture user data.

DigiCipher N/A

EIA-608 and 708 Sends A/53 compliant 'ATSC format' closed captions.

Only EIA-608 Sends only EIA-608 'NTSC1' and 'NTSC2' closed captions.

Only EIA-708 Sends only EIA-708 'DTVCC' closed captions.

Teletext

Enable WST Teletext

Indicates if the system should extract teletext data from the video VBI lines.

Checked ITU-R System B Teletext is extracted from the PAL VBI lines specified on the 'Teletext Lines per Field' dialog. These data are conveyed in a separate stream associated with the encoding program. This stream is identified by the 'Teletext PID' shown in the 'Program PID Assignments dialog'.

Not checked Teletext is not extracted from the VBI lines.

Encode VBI Lines as Video

This control affects the algorithm used to code the VBI.

Applies only to EVA-110 encoders operating in PAL 608 line mode or NTSC 512 line mode only.

Checked Encodes VBI lines using I-frame macroblocks.

Not Checked Encodes VBI lines using current picture type.

21.2.6 Config > Trunk # > Program # > Teletext/Data >Teletext Lines Dialog

Field 1 and Field 2 Lines

Check the lines in each field from which Teletext data should be extracted.

Note: The 'Enable WST Teletext' control must be checked on the 'Teletext Properties' dialog to enable these check boxes.

The encoder reserves bandwidth for each line being extracted whether or not Teletext data is actually found on the line.

7-22 Range of acceptable field 1 lines.

320-335 Range or acceptable field 2 lines.

Bitrate (bps)

This control displays the amount of bandwidth consumed by all scanned lines of teletext.

21.2.7 Config > Trunk # > Program # > Serial # > Serial Properties Dialog

Serial Application

Specifies the encoder's use of this serial port.

None Do not use this serial port.

Data Input Use this serial port for ancillary data input.

Timecode Input Use this serial port for timecode input.

Video Router Use this serial port to provide router control.

Captions Use this serial port for closed caption input.

Note: Choosing this option sets the Closed Captions Input Source in the 'Teletext Properties' dialog to 'Serial Port'.

Communication

Serial Standard

Use this control to specify the serial port's data protocol. Check the user manual for your equipment's proper settings.

RS-232 Protocol typically used most external equipment.

RS-422 Protocol used for timecode or other such equipment.

Baud Rate

Sets the serial data interface baud rate.

Echo

Enables or disables input echo.

21.2.8 Config > Trunk # > Program # > Serial # > Serial Application Properties

Data Input

PES Interval (ms)

This control sets the millisecond interval between successive data Packetized Elementary Stream (PES) header transmissions. Each PES packet will contain N bytes of payload, where N = serial port data rate * (this setting)/8/1000, and the payload unit start indicator is only set at the beginning of each PES packet.

PES Stream ID

This control specifies the PES stream ID used in PES headers.

188 to 255 This range represents possible stream ID numbers.

PMT Stream Type

This control affects contents of a descriptor attached to the Program Map Table (PMT) this data stream.

Timecode Input

Send Timecodes in Picture User Data

ON/OFF Send timecode in picture user data.

Video Router

These settings are applicable only when a video router is used to provide redundancy switching between a group of encoders. The manual shipped with your FlexiCoder™ DVS discusses redundancy and router configuration in detail.

Input Port

Identifies the input port on a video router through which video feeding this encoder is passed.

1 to N, where N = The number of router inputs.

1 to 15 For this range of values, no AFD output is included in the bit stream.

16 to 31 For this range of values, the bottom four bits become the AFD value used in the bit stream as long as no AFD is provided in the VANC. If AFD is present in the VANC, then that value is used instead.

Output Port

Identifies the router output port from which video 'normally' feeding this encoder is passed.

normal – The state when no encoder has failed.

1 to N, where N = The number of router outputs.

21.2.9 Config > Trunk # > Program # > Program > Program Output Properties

Output

Name

Use this control to enter a name that you would like to use to identify the program here. This name identifies the program in the Vidiem™ Element Management System's Navigation Pane.

Total Bitrate

Use this control to set the total bitrate for the selected program.

To view the bitrate for all programs on all trunks, and to see the available bitrate for this trunk, go to the 'Bandwidth Tab' under the 'Network Output' branch of the 'Navigation Pane'.

Video Bitrate

Indicates the computed bitrate available for video in this program. This rate is calculated by subtracting all the programs fixed-rate items (audio, data, teletext, etc.) from the 'Total Bitrate' (above) assigned to this program.

PDU Size (packets)

Use this control to specify the number of MPEG-2 packets in each AAL 5 Payload Data Unit (PDU).

2 Typical setting used for most MPEG-2 applications. This setting is used when the system operates in transport stream mode.

38 (ATM mode only) Use this setting to create PDUs that are just under 8 Kbytes in length.

338 (ATM mode only) Use this setting to create PDUs that are just under 64 Kbytes in length.

Enable Null Packets

This setting enables or disables the encoder's null packet generation.

Checked Use this setting to generate a constant bit rate transport stream. The system inserts null packets to pad the program bandwidth up to the specified Total Bitrate.

Not Checked (ATM mode only) Use this setting if you want to generate a variable rate transport stream into an ATM network. This selection must be used in conjunction with the 'Manual Minimum Quantizer' control.

Note: See the "Config > Trunk # > Program # > Video > MPEG-2 Video Processing Properties Dialog" on page 546 for details.

Enable Output

Use this control to enable or disable program output. This control works in conjunction with the 'setup' and 'setups' controls.

Stop Generating MPEG-2 on Loss of Input

Use this control to specify the encoder's output behavior upon loss of signal (LOS) video input.

Checked Encoder stops generating transport stream packets when a video loss of signal (LOS) occurs. Output is automatically resumed once input is restored.

Not Checked Encoder continues generating transport stream packets when a video loss of signal (LOS) has occurred.

MPEG-2 Control

CA System ID

Use this control to specify the type of conditional access system used.

PCR Interval (ms)

Use this control to specify the maximum interval between successive Program Clock Reference (PCR) fields. MPEG-2 compliance requires this to be set less than or equal to 100 ms.

PSI Program Number

Use this control to specify the MPEG-2 'program number'. The value specified is used as an entry in the Program Allocation Table (PAT) table. Each program assigned to an MPEG-2 transport stream has a unique PSI program number.

PSI Interval (ms)

Use this control to set the maximum interval between successive Program Allocation Table (PAT) and Program Map Table (PMT) transmissions.

0 This setting disables PSI transmission.

1 to 65535 This setting specifies the PSI transmission interval in milliseconds.

21.2.10 Config > Trunk # > Program # > Program > Program PID Assignments Dialog

(PID Table)

The table in this dialog lists the PID number of each element of the current program. A PID value is assigned to every new encoding program, associated audio channel, or data application that is created. The setting of the System Variant affects which formula is used to calculate the PID value. Table 21-1 shows the formula that is used to calculate PID values for each System Variant. The 'System Variant' setting is located in the 'Video Network Properties' dialog. See Section 26 "FlexiCoder™ DVS Network Configuration" on page 587

Table 21-1 Formulas Used for PID Assignments

Item	'System Variant'			Notes
	Digicipher	ATSC	MPEG-2	
PSI Program Number	p	p	p	In ATM mode, each program has its own multiplex, so the PSI program is typically 1 for all programs. For transport stream mode, each program in a transport stream must have a unique PSI program number. Program numbers start at one, zero being reserved as invalid.
Base PID	32 + 16(p - 1)	48 + 16(p - 1)	32 + 16(p - 1)	Each program normally occupies a range of 16 PIDs, starting at a value determined by the PSI Program Number. Specific PIDs within each group are determined by the type of information carried.
PCR PID	Base PID + 0	Base PID + 1	Base PID + 1	Normally, the system puts PCRs (program clock references) in the video. If a program has only a single audio (and no video), the PCRs go with the audio.
Video PID	Base PID + 0	Base PID + 1	Base PID + 1	A program can have no more than one video component. The DVS allows an audio only program (with a single audio component).
Audio PID	Base PID + 1	Base PID + 4	Base PID + 4	If a program has multiple audio components, they are assigned to successive PIDs. The system allows no more than 8 audio PIDs per program.
PMT PID	Base PID + 5	Base PID + 0	Base PID + 0	—
CA PID	Base PID + 5			—
Data PID	Base PID + 10	Base PID + 10	Base PID + 10	Data include serial data, ancillary data, and teletext. If a program has multiple data components, they are assigned to successive PIDs.

To specify your own PID values, select the value that you want to change and edit it. Press the 'OK' button to send changes to the system when you are done.

PSI Program Number (read only)

This field indicates the PSI Program number of this stream in the multiplex.

Base PID (read only)

This field indicates the Base PID Of the program shown in the PID Table on the left side of this dialog.

For various reasons, some programs may not use PID values that are compliant with the select System Variant standard. If this is the case, then the recommended practice is to use the Base PID value shown in this filed, in conjunction with the appropriate formula (column) in Table 21-1 above to assign program PID values.

21.2.11 Config > Trunk # > Program # > Program > Program Routing Properties Dialog

Use this dialog to specify the Virtual Circuit Identifier (VCI) and Virtual Path Identifier (VPI) to apply to the current program.
These values are used internally to identify the program on the system backplane for local decoders.
If your system is equipped with an ATM I/O card then the specified VPI:VCI pair will identify the program on the network.

21.2.12 Config > Trunk # > Program # > Program > Program Setups Dialog

Use this dialog to select each setup that you want this program to be a part of.

21.2.13 Config > Trunk # > Program # > Audio Properties Dialog

Compression

Standard

Sets the audio compression standard as Dolby AC-3, IEC-958 Dolby AC-3, MPEG-2 Audio, SMPTE 302 Audio, or SMPTE 302 Data.

Dolby AC-3 Uses the module's internal AC-3 encoder.

IEC-958 Dolby AC-3 Allows pass-through of an externally encoded Dolby AC-3 bitstream.

MPEG-2 Audio Uses the module's internal MPEG-2 encoder.

SMPTE 302 Audio Allows the transmission of uncompressed (linear PCM) digital audio (HDP-ONLY).

SMPTE 302 Data Allows the passthrough of a linear PCM stream containing compressed audio data such as Dolby E.

Separate Audio Input (option)

Use these controls to identify the audio input source as separate from the video signal (not embedded), and either analog of digital. Digital audio must be compliant with AES/EBU.

Embedded Audio Input (option)

Use these controls to identify the audio source as embedded in video, and to select the audio group to extract from the video signal.

Use System Decoder Rates (checkbox)

Check this control to limit the encoder's audio bitrate options (below) to only those rates that can be decoded by QDEC decoder.

Bitrate

Sets the audio elementary stream bitrate for coded audio.

SMPTE 302 Precision (bits)

Identifies the audio elementary stream's sampling resolution (bits per sample).

Coordination

Decoder Buffer Level

This control sets the desired fullness of the decoder's audio buffer. This is typically set at 2048 but can be adjusted for decoders that have small audio decoder buffers. The range for this control is 0 to 2048, or 20000 to 65024 (bytes)

Note: SMPTE 302 audio: this value should be between 20,000 and 65,024 (bytes).

Note: WaveStar Decoder 4:2:2 Model 100: Due to the audio buffering required in the WaveStar Decoder 4:2:2 Model 100, the audio decoder buffer level setting on the MPEG-2 encoder producing the transport stream must be set sufficiently large. The decoder buffer level setting depends on the encoder video rate and the external delay configured on the WaveStar Decoder 4:2:2 Model 100. The formula is:
Decoder buffer level >= max{5 * audio_rate_in_kbs, -(audio_offset * audio_rate_in_kbs)}

Lip Sync Delay (ms)

Sets the lip-sync offset adjustment.

- 32767 to 0	Causes the audio signal to precede delivery of the video signal. Depending on other properties, the offset range is limited (i.e. the encoder cannot be asked to transmit the audio signal before it arrives at the encoder).
0	Synchronizes the audio and video.
0 to 32767	Adds delay to the audio relative to the video signal.

Language

Any 3-character abbreviation for a language.

PES Header Interval (ms)

Sets the time interval between successive audio PES headers in milliseconds. For MPEG-2 compliance, this property must be less than or equal to 700 except for the value zero which disables PES header generation. In addition, PES headers are sent at most once per audio frame so a value of '1' effectively sends one on each audio frame.

21.2.14 Config > Trunk # > Program # > Audio Bitstream Information Dialog

Bitstream Information

Center Mix Level

Sets the downmix level for center channel relative to left and right when using the 3/0, the 3/1, or the 3/2 'Audio Coding Mode'. This control is typically set to '-3'.

Note: See "Config > Trunk # > Program # > Audio Service Properties Dialog" on page 560 for a description of the 'Audio Coding Mode'.

Copyright Bit

Enables/disables the audio flag indicating copyrighted material.

checked Indicates the information is copyright protected.

not checked Indicates the information is not copyright protected.

Original Bitstream

Enables/disables the audio flag indicating first generation, original material.

Surround Mix Level (dB)

Sets the downmix level for surround channels relative to left and right Decoder Parameters. This property is typically set to 'OFF'.

Dolby Surround Mode

This property indicates whether or not a 2-channel Dolby AC-3 bit stream is conveying a Dolby Surround encoded program. This information is not used by the Dolby AC-3 decoding algorithm, but may be used by other portions of the audio reproduction equipment, such as a Dolby Pro Logic Surround decoder.

Dolby Surround Encoded Indicates to an external decoder that the surround audio channels use Dolby surround encoding.

Not Dolby Surround Encoded Indicates to an external decoder that surround audio channels are not available.

Not Indicated Does not indicate whether or not surround audio channels are available.

Primary/Secondary Production Information

Check this control to manually set the Mix Level and Room Type (Production Information) for the respective (primary or secondary) audio channel.

Mix Level (dB SPL)

Indicates the type and calibration of the mixing room used for the final audio mixing session.

Room Type

Indicates the type and calibration of the mixing room used for the final audio mixing session. This property is typically set to 'not indicated'.

21.2.15 Config > Trunk # > Program # > Audio Internal/External Encoding Dialog

External Encoding

Use these controls if you are using an external Dolby AC-3 encoder.

External Delay (ms)
Use this control to cause the delivery of the audio signal to precede the delivery of the video signal. The value you select should approximate the amount of time the external Dolby AC-3 encoder takes to encode audio. Other settings may limit the maximum value used for this setting because, for example, the encoder cannot transmit the audio before it arrives.

Stream Index
When receiving compressed audio from an external source (IEC 958), up to eight independent elementary streams may be included in the multiplex. This property identifies the stream carrying the audio signal to add to this program.

Internal Encoding

Use these controls if you are using an internal encoder.

Mute (checkbox)
Turns off the audio.

Gain (dB)
Specifies the digital multiplier for the PCM audio samples. This property is typically set to '0.0'.
If the system gain is too high, make sure that the Nominal Input Level (below) is set properly.

Nominal Input Level
Sets the expected analog audio input signal levels prior to sampling.

21.2.16 Config > Trunk # > Program # > Audio Preprocessing Properties Dialog

Dynamic Range Compression

Compression Characteristic

This control sets the characteristic curve of the dynamic range compression algorithm which is built in to the AC-3 Encode function. Dolby AC-3 decoders use the compression characteristic to reduce the audio program's dynamic range. However, a user who desires program reproduction with the original dynamic range may disable this feature.

RF Overmodulation Protection

This property determines if a RF pre-emphasis filter is used in the clip protection algorithm to prevent RF over-modulation in set-top-box decoders.

Input Filtering

Digital Deemphasis

The precise function of the de-emphasis filter is dependent upon the system's audio standard setting.

If the audio standard is set to AC-3 then the following descriptions apply.

AUTO Detects channel status bits in AES/EBU stream and turns the 50/15ms de-emphasis filter either 'ON' or 'OFF' accordingly.

ON Turns 50/15ms de-emphasis filter 'ON'.

OFF Turns de-emphasis filter 'OFF'.

If the audio standard is set to MPEG-2 Audio then the following descriptions apply.

AUTO Detects channel status bits in AES/EBU stream and sets bits to indicate the type of emphasis that has been applied.

ON Set stream bits to 50/15ms.

OFF Set stream bits to 'no emphasis'.

Bandwidth Lowpass Filter (checkbox)

Activates/deactivates a lowpass filter with a cutoff near the specified audio bandwidth.

DC Highpass Filter (checkbox)

Activates/deactivates the highpass filter for all input channels.

LFE Lowpass Filter (checkbox)

Activates/deactivates a 120 Hz lowpass filter applied to the low-frequency effects input channel. This property is typically disabled.

21.2.17 Config > Trunk # > Program # > Audio Service Properties Dialog

Service Configuration

Audio Coding Mode

Sets the number of full-bandwidth audio channels within the encoded bit stream and also indicates the channel format. The Audio Coding Mode is designated as two numbers, m/n, with m indicating the number of front channels, and n indicating the number of rear (surround) channels. For example, if the mode is set to 1+1, then two completely independent program channels (dual-mono), referenced as Ch1 and Ch2, are encoded into the bit stream.

1/0: C	One front audio channel: Center.
1+1: L/Ch1, R/Ch2	Two completely independent program channels (dual-mono), referenced as Ch1 and Ch2, are encoded into the bit stream.
2/0: L, R	Two front audio channels: Left and Right.
3/0: L, C, R	Three front audio channels: Left, Center, and Right.
2/1: L, R, Ls	Two front audio channels: Left and Right. One surround audio channel: Left surround.
3/1: L, C, R, Ls	Three front audio channels: Left, Center, and Right. One surround audio channel: Left surround.
2/2: L, R, Ls, Rs	Two front audio channels: Left and Right. One surround audio channel: Right surround.
3/2: L, C, R, Ls, Rs	Three front audio channels: Left, Center, and Right. Two surround audio channels: Left surround, and Right surround.
J2/0	Stereo audio.

Primary Dialog Normalization (dB)

Sets the dialog level relative to digital full scale level.

Bitstream Mode

This property indicates the type of service that the bit stream conveys.

Commentary	Commentary associated service.
Dialogue	Dialog associated service.
Emergency	Emergency associated service.
Hearing Impaired	Hearing Impaired associated service.
Karaoke	Reserved associated service.
Complete Main	Main audio service.
Music and Effects	Music & Effects main audio service.
Visually Impaired	Visually Impaired associated service.

Secondary Dialog Normalization (dB)

Sets the dialog level relative to digital full scale level for the second channel in 1+1 configuration audio coding mode) This property is set only when functioning in dual mono mode (1+1).

Enable LFE

Enables/disables the low-frequency effect or sub-woofer channel. Only enable this property for encoders with more than two channels.

Chapter 22: FlexiCoder™ DVS Decoder Modules 22

22.1 Decoder Module Procedures

22.1.1 How to Create a FlexiCoder™ DVS Decoding Session

1. Expand the 'Decoding' branch in the navigation tree.
2. Double-click an unused slot and channel decoder entry. The Vidiem™ Element Management System opens the 'Decoder Properties' dialog box.
3. Configure the decoder's properties.
4. Click 'OK'.
5. Click the 'Write Device' icon on the menu bar.

22.1.2 How to Delete a FlexiCoder™ DVS Decoding Session

1. Expand the 'Decoding' branch in the navigation tree.
2. Right-click on the name of a decoding session in the navigation tree.
3. Select 'Delete' from the menu.
4. Click the 'Write Device' icon on the menu bar.

22.2 Decoder Configuration Dialogs

22.2.1 Config > Decoding > Decoder Input Properties Dialog

Identity

Name

This property labels the on-screen display with a program name. White space may be used in the program name.

Input

Source

Specifies the source of the decoder input.

None	Deactivates the decoder.
Local Encoder	The decoder input comes over the backplane from an encoder in the same shelf. Set the program you wish to decode by selecting it from the Encoder Name drop-down list.
Network	The decoder input comes over the network from a remote encoder. Set the program you wish to decode by entering the proper PSI Program number, VPI and VCI.
Decoder 310 Port	This property is used exclusively with the HDEC-100. The HDEC can decode a program received through this input rather than through the system backplane. Example: Connect one of the NIM-IO-310 module's outputs to this connection for monitoring purposes.

Encoder Name

When 'Local Encoder' is selected as the decoder's Input Source, this drop down lists any programs that this decoder can be used to decode.

PSI Program

Specifies the program number of the program to decode. This number may only be set when you select the Network Input Source.

VCI (Virtual Channel Identifier)

Specifies the VCI of the program to decode. This number may only be set when you select the Network Input Source.

VPI (Virtual Program Identifier)

Specifies the VPI of the program to decode. This number may only be set when you select the Network Input Source.

22.2.2 Config > Decoding > Decoder Audio Properties Dialog

Standard

Audio Formats

These controls identify the audio compression format of the incoming program.

Dolby AC-3 Use this option if the audio was encoded using Dolby AC-3.
If the audio feed is to be decoded using and external Dolby AC-3 decoder, then choosing this option will allow you to add the delay needed for proper lip sync by checking the 'IEC-958 Decoder' checkbox and specifying a 'Delay' value (see descriptions below).

MPEG-2 Use this setting if the audio was encoded using a generic MPEG encoder.

Primary/Secondary (Groups)

These groupings identify controls belonging to the primary and secondary audio channels.

Stream Index

Use this control to select the embedded audio stream to decode.

Delay (for the internal decoder in milliseconds)

This specifies the delay that the system adds to the audio presentation time. The range for this control is -32676 to +32676

IEC-958 Decoder

Enables or disables the external decoding mode and its associated delay (below).

Delay (for the IEC-958 Decoder in milliseconds)

Use this control to specify the amount of delay the system should add to the external audio presentation time.

0 to 65535 The range for this control is 0 to 65535.

22.2.3 Config > Decoding > Decoder Video Properties Dialog

Video Standard

Video Standard

Sets the decoder to the video standard of the signal to be decoded.

Signal

Input Loss

Defines the decoder video output behavior if the input signal disappears.

Black	Displays black screen.
Freeze	Displays the last good picture.
No Input	Displays a text message of 'No Input' on a black background.
No Sync	No video, or video sync pulses are output.

Enable Genlock

Enables or disables video genlock. Changes to this parameter cause the module to reset. This property automatically disables itself when decoding using an HDEC-100. Changes to this property require a system reset in order to become effective.

Generate Closed Captions

Enables or disables the insertion of closed caption data into video lines 21 and 284. Use this command to encode NTSC material only. If this property is enabled and closed captions are not sent, then the decoder inserts null packets on these lines.

On-Screen Display

Display Logo

Enables or disables the logo display. This property automatically disables itself when decoding using an HDEC-100.

Display Name

Turns the on-screen display ON or OFF, or changes the color.

If the 'Name' field is assigned a string and this control is checked, then the assigned string appears in the on-screen display.

If the 'Name' field is not assigned a string and this control is checked, then the decoder's channel number appears in the on-screen display. This property automatically disables itself when decoding using an HDEC-100.

Note: The 'Name' filed is described in the "Config > Decoding > Decoder Input Properties Dialog" on page 562.

22.2.4 Config > Decoding > Decoder Video Router Properties Dialog

Video Router

These settings are applicable only when a video router is used to provide redundancy switching between a group of decoders. The printed manual shipped with your FlexiCoder™ DVS discusses redundancy and router configuration in detail.

Input Port

Identifies the input port on the video router that receives video from this decoder.

1 to N, where N = The number of router inputs.

Output Port

Identifies the output port on the video router that provides video from this decoder to other equipment.

1 to N, where N = The number of router outputs.

22.3 Decoding Configuration Tables

22.3.1 Decoders Table

Abstract: *This table lists all of the decoders in the system.*

Bitstream Source
Indicates the source of the bitstream feeding the decoder.

Input Source
Indicates the source of the video feeding the decoder.

PSI Program
Indicates the configured PSI program number.

Router Input
Indicates the configured router input.

Router Output
Indicates the configured router output.

VCI
Indicates the VCI on which the decoder is configured to look for the program.

VPI
Indicates the VPI on which the decoder is configured to look for the program.

Audio Standard

Primary/Secondary Audio Index

Decoder
Indicates the type of audio decoder the module is configured to use.

Delay (ms)
Indicates the audio delay (audio relative to video) setting.

External Delay (ms)
Indicates the delay setting use to accommodate and external audio encoder.

Video Standard

Adjust Clock Dynamically
Indicates if the decoder is configured to automatically adjust its clock.

Generate Closed Captions
Indicates if the encoders is configured to generate closed captions.

Genlock
Indicates the configured state of Genlock.

Input Loss
Indicates the configured behavior when the decoder experiences a loss of signal.

Output Sync
Indicates the configured synchronization method (trim-level, h-v) that the decoder is configured to use.

On-Screen Display Name
Indicates specified string for the on-screen display.

Logo
Indicates is the logo is configured to display.

Monitor
Indicates is the on-screen monitor is configured to be displayed.

Chapter 23: FlexiCoder™ DVS Mini Master Control Module

23

23.1 Master Control Dialogs

23.1.1 Config > Master Control Video Properties Dialog

Video

HD Standard

Use this control to specify the High Definition video standard used by the board.

Serial Application

Use this control to specify the usage of the MMC-IO-STD's serial port labeled '422'.

Interactive Controller Configures the serial port to interface with the MASTERplus Controller GUI.

ADV Automation Configures the serial port to interface with automation control system using the automation control protocol defined in the table labeled 'MMC-100 AUTO-ADV Automation Control Protocol' in the FlexiCoder™ DVS Installation and Operation Manual.

Grass Valley Automation Configures the serial port to interface with automation control system using the automation control protocol defined in the table labeled 'MMC-100 AUTO-GV Automation Control Protocol' in the FlexiCoder™ DVS Installation and Operation Manual.

Aspect Ratio

Use this control to specify the method that the upconverter uses to scale the 4x3 Standard Definition image to fit a 16x9 High Definition display.

Keyhole The SD image is scaled with a constant aspect ratio until it fills the screen vertically.

Keyhole Variant The SD image is scaled such that the top and bottom of the image are slightly cropped. This is beneficial because it reduces the width of the screen sidebars.

Letterbox The SD image is scaled with a constant aspect ratio until it fills the screen horizontally. This selection crops off the top and bottom of the SD image.

Anamorphic The SD image is scaled both vertically and horizontally to fill the screen.

In each selection except anamorphic, the background screen area is filled with the specified 'Background Color' (described below).

Background Color

Use this control to specify the upconverter's background color (also called 'sidebars', or 'matte') The background color is the visible border located on each side of the active picture in the Keyhole and Keyhole Variant aspect ratios.

Black Border is displayed in black (RGB 0,0,0).

Gray Border is displayed in gray (RGB 128,128,128).

Custom Border is displayed in the color you select by pressing this button and choosing from the Windows color picker.

23.1.2 Config > Master Control SD and HD Audio Dialog

This topic covers these three dialogs:

- The 'Master Control HD1 Audio Properties' dialog controls settings for the audio connection labelled 'HD IN A'.
- The 'Master Control HD2 Audio Properties' dialog controls settings for the audio connection labelled 'HD IN B'.
- The 'Master Control SD Audio Properties' dialog controls settings for the audio connection labelled 'SD IN'.

Audio Control

Channels

Use this control to specify the number of audio channels on the respective audio input.

2 The audio input is a stereo pair.

6 The audio input is six-channel (Dolby 5.1) surround sound.

Delay

Use this control to set the delay of the audio, relative to video, in milliseconds. A negative number causes audio to lead video.

Audio Source

Separate Audio Input

Use this control to identify the audio input source as separate from the video signal (e.g. not embedded).

Embedded Audio Input

Use this control to identify the audio source as embedded in video.

(Selections)

Use this control to select the desired audio group and pair from within the video signal.

23.2 Master Control Table

Abstract: *This table lists the properties of each MMC module in the system.*

HD Standard
Indicates the configured HD output standard.

Serial Application
Indicates the configured functionality of the MMC-IO-STD I/O module's serial port.

Aspect Ratio
Indicates the configured aspect ratio of the output video.

Background Color
Indicates the color specified for the matte portion of the screen.

Audio Source HD 1, HD2
Indicates whether the audio channels are configured as having separate or embedded sources.

Audio Channels HD1, HD2
Indicates the number of audio channels.

Audio Delay
Indicates the size of the audio delay configured for each audio channel.

Chapter 24: FlexiCoder™ DVS Transport Stream Importer Module

24

24.1 Overview of FlexiCoder™ DVS TSI-100 Services

The Transport Stream Importer (TSI-100) module provides transport stream importation and re- multiplex capabilities. The TSI-100's I/O card (TSI-IO-STD) provides the FlexiCoder™ DVS with four BNC input interfaces and one RJ-45 (Ethernet) input interface. The four BNCs each accept an ASI transport stream at rates ranging from 1 to 130 Mbps. The 10/100BaseT Ethernet interface accepts up to 16 single or multi-program transport streams, each mapped onto a unique UDP port. Ethernet input ranges from 1 to 10 Mbps.

Each of the TSI-100s user-defined services filter incoming transport streams for specified programs and associated PIDs. Each service extracts one PSI program and data on any associated PIDs that are listed in the PMT. Each extracted program is buffered and assigned to a user-selected backplane trunk.

24.2 TSI Configuration Procedures

24.2.1 How to Create a FlexiCoder™ DVS TSI-100 Service

This procedure is applicable only to the FlexiCoder™ DVS TSI-100 Module.

1. Click on 'System' in the navigation pane.
2. Open the 'Channels' tab.
3. In the row containing the TSI-100, left-click somewhere in the row and hold the mouse button.
4. Drag the service to the desired 'Trunk' in the navigation pane so that the Trunk becomes highlighted.
5. Drop the service on the desired trunk. The Encoder Wizard opens.
6. Follow the Wizard's instructions. Upon completion of the wizard, the service is listed under the Trunk selected in step 4.

24.2.2 How to Use the TSI Service Wizard

Use this page of the wizard to specify details of the TSI-100 service.

Input PSI Program

Specifies the number of the MPEG-2 PSI program that *this* service should extract from the transport stream.

Input Port Type

Specifies the type of input port that the service uses.

ASI Use this setting if the program enters the TSI-IO-STD via an ASI port.

UDP Use this setting if the program enters the TSI-IO-STD via its Ethernet port.

Input Port Number

Use this control to assign an input to a service. Multiple services can use the same ASI input or UDP input port.

1-4 This range is available if the Input Port Type is set to 'ASI'.
In this context, the value selects the ASI port on the TSI-IO-STD that shall provide the specified service with input.

4901-4916 This range is available if the Input Port Type is set to 'UDP'.
In this context, the value specified identifies the UDP port that shall provide the service with input. Up to sixteen UDP ports may be used concurrently.

Chapter 25: FlexiCoder™ DVS Trunk Configuration

25

25.1 StatMux Configuration Procedures

FlexiCoder™ Digital Video System firmware release 4.0 introduces the ability to create a statmux group containing both high definition (HD) and standard definition (SD) programs. This application note details how to use the Vidiem™ Element Management System to configure the FlexiCoder™ DVS for HD/SD statmux operation.

25.1.1 How to Create a Statmux Group

1 Use the 'Encoder Setup Wizard', as needed, to create programs for use in the statmux group.

- See the Vidiem™ Element Management System help topic "How to Create a FlexiCoder™ DVS Encoding Session" on page 543' for details.
- All programs in a statmux group must be located on the same trunk.
- Use the appropriate table below for recommended HD/SD statmux program total rates.

Table 25-1 Recommended Total Rates for 720P and 1080I HD/SD Statmux Programs[1]

Program Type	Rate/Program 2-Program StatMux Group	Rate/Program 3-Program StatMux Group
HD Program	15,850,000 bits/sec	13,850,000 bits/sec
SD Program 1	3,300,000 bits/sec	2,650,000 bits/sec
SD Program 2	—	2,650,000 bits/sec

Table 25-2 Recommended Total Rates for 480P HD/SD Statmux Programs[2]

Program Type	Rate/Program 2-Program StatMux Group	Rate/Program 3-Program StatMux Group	Rate/Program 4-Program StatMux Group	Rate/Program 5-Program StatMux Group
HD Program	15 Mbps	11 Mbps	8.2 Mbps	6.6 Mbps
SD Program 1	4 Mbps	4 Mbps	3.6 Mbps	3.1 Mbps
SD Program 2	–	4 Mbps	3.6 Mbps	3.1 Mbps
SD Program 3	–	–	3.6 Mbps	3.1 Mbps
SD Program 3	–	–	–	3.1 Mbps

Note: The FlexiCoder™ DVS's HD/SD statmux facilities are not limited to groups with the number of programs specified in Table 25-1, more programs may be added. However these combinations are recommended for operation within the 19.39 Mbps ATSC bandwidth limitation.

2 In Vidiem™'s main navigation tree, select 'Network Output > Trunk # (the trunk containing the programs you want to statmux)' and select the 'Routing Summary' tab.

3 Double-click on the white portion of the row labelled 'Statmux Group' to open the 'Trunk Properties' dialog.

1. Assumes a transport stream rate of 19.39 Mbps, with 200 Kbits/sec of PSIP data.
2. Assumes a transport stream rate of 19.39 Mbps, with 200 Kbits/sec of PSIP data.

4 For each program that you want to add to the statmux group.
   - Highlight the program name in the 'Trunk Properties' navigation tree.
   - Verify that the total bitrate is set correctly.
   - Place a check mark in the 'Enable StatMux' checkbox.

5 Click 'OK', and select 'Device > Write' from the Vidiem™ Element Management System's menu bar to write these changes to the FlexiCoder™ DVS.

25.1.2 How to Optimize GOP-Structure Frame Spacing for StatMuxed Programs

The following settings are recommended to provide improved performance dynamics on most content.

- Set the 'Number of B-Frames' to '1' for each SD program in the statmux group.
- Set the 'Number of B-Frames' to '2' for each HD program in the statmux group.

Use the following procedure to configure these settings.

1 Expand the 'Network Output' and 'Trunk #' branches of the configuration tree.
2 Right-click on the desired program and select 'Properties'. This action opens the 'Encoder Properties' dialog.
3 Expand the 'Video' branch.
4 Click on the 'MPEG-2 Structure' branch.
5 In the 'MPEG-2 Video Structure Properties' dialog, set the 'Number of B-Frames' as desired.

Note: For HD 720p material only: Set the I-frame spacing to 30 fps.

6 Press the 'OK' button to exit the dialog.
7 Select 'Device > Write' from the menubar to write these changes to the FlexiCoder™ DVS.

25.2 Trunk Configuration

25.2.1 Config > Trunk # > Trunk Properties Dialog

Trunk

Auxiliary Data Bitrate (bps)
Use this control to set the maximum bitrate that the system will use for auxiliary data. Auxiliary data enters the system via the NIM-100's Ethernet port.

Transport Stream ID (decimal)
Use this control to specify the Transport Stream ID carried in the MPEG-2 transport stream's Program Allocation Table (PAT). This control accepts a *decimal* number between 0 and 65535.

Data Carousel

Enable Streaming
Use this control to enable the system to begin inserting data into the transport stream.

Bitrate (bps)
Use this control to set the maximum bitrate that the system will allow to be used for Data Carousel.

Pathname
Use this control to specify the location of an external data file that is generated by either a PSIP system or a datacasting system.

25.2.2 Config > Trunk # > Load New File Into Data Carousel Dialog

Load Button
Use this button to make the FlexiCoder™ DVS load the desired data file using the TFTP server. This file will then be used for streaming.

25.2.3 Config > Trunk # > StatMux Properties Dialog

Use these controls to configure bandwidth at the trunk (rather than the program) level.

Fixed Rate Encoders

Fixed Rate Total (bps)
Use this control to set the sum bitrate of all fixed-rate programs on this trunk. 'Fixed-rate' programs are those that are not part of a StatMux group.

Fixed Rate Average (bps)
Generates and displays an average of the Fixed Rate Total divided by the number of 'fixed bit rate' programs on this trunk. The Fixed Rate Average = Fixed Rate Total / # of encoders. This parameter is read-only.

Hold Total Rate Constant (checkbox)
Use this control to ensure that the Fixed Rate Total (above) is maintained.

Checked The sum bitrate allocated to all fixed rate programs on this trunk remains the same even as individual encoders are added or deleted.

Unchecked The sum bitrate allocated to all fixed rate programs on this trunk is altered as individual encoders are added or deleted.

Statmux Encoders

StatMux Bitrate Total (bps)

Use this control to set the sum bitrate of all StatMux programs on this trunk.

StatMux Rate Average (bps)

Generates and displays an average of the StatMux Bitrate Total divided by the number of program in this trunk's StatMux group.
(Fixed Rate Average = StatMux Bitrate Total / # of program in StatMux group)

Hold Total Rate Constant (checkbox)

Use this control to ensure that the StatMux Total (above) is maintained.

Checked The sum bitrate allocated to all StatMux programs on this trunk remains the same even as individual encoders are added or deleted.

Unchecked The sum bitrate allocated to all StatMux programs on this trunk is altered as individual encoders are added or deleted.

Summary

Active Setup (read only)

This control displays the current active setup.

Unused Bandwidth (bps read only)

Displays the amount of available bandwidth on the selected trunk.

25.2.4 Config > Trunk # > StatMux > Program # Dialog

Total Bitrate

This control sets the total bitrate for the selected program.

(This control provides another access point to the Total Bitrate control on the 'Program Output Properties' dialog.)

To view the bitrate for all programs on all trunks, and to see the available bitrate for this trunk, go to the 'Bandwidth Tab' under the 'Network Output' branch of the 'Navigation Pane'.

Encoder Active (read only)

This field indicates the encoder's state. The encoder's state is a function of the program level 'Enable Output' control, the 'Setups' control, and the system-level 'Setup' control.

- The program level 'Enable Output' control is located on the 'Program Output Properties' dialog. See "Config > Trunk # > Program # > Program > Program Output Properties" on page 551 for details.
- The program level 'Setups' control is located in the 'Program Setups' dialog. See "Config > Trunk # > Program # > Program > Program Setups Dialog" on page 554 for details.
- The system-level 'Setups' control is in the 'Video Network Properties' dialog. See "Config > System > Network > Video Network Properties" on page 587 for details.

Enable Statmux (checkbox)

Check this box to enable the StatMux feature for the selected program.

Bitrate Limits

Use this control to set the range over which the video bitrate is allowed to vary.
The 'Automatic' setting (below) is highly recommended for most applications.

Automatic	Automatically calculates the minrate and maximum bitrate.
Manual	System uses user-defined maximum and minimum rates. See Maximum/Minimum Bitrate below.
Manual Maximum	This setting specifies the maximum total bitrate that the statmux algorithm can select for this encoder. The minimum total bitrate is automatically calculated by the statmux algorithm.
Manual Minimum	This setting specifies the lowest total bitrate that the statmux algorithm can select for this encoder. The maximum total bitrate is automatically calculated by the statmux algorithm.

Bias

Use this control to give some programs higher priority over others. Programs with higher bias are provided a higher average bitrate than other statmux programs on this trunk. If all programs within the statmux group are assigned the same bias value, then this control has no effect.

Maximum/Minimum Bitrate

Use these controls to manually specify the maximum and the minimum video bitrate for this program when it operates in statmux mode.

25.2.5 Config > Trunk # > Transport Stream Input Properties Dialog

This dialog is visible only when the FlexiCoder™ DVS is operating in ATM mode and a NIM-IO-ASI card is installed behind the main NIM-100 module. These controls configure the NIM-IO-ASI card acting, in this (ATM) mode as an input interface.

Interface

Format

Use this control to select the NIM-IO-ASI card's active interface (ASI or DS3).

Drop Null Packets (checkbox)

Check this control to make the NIM-IO-ASI card remove null packets from the incoming transport stream.

Checked Use this setting if the system has both input and output ASI interfaces.

Enable Output (checkbox)

Use this control to enable or disable the NIM-IO-ASI. This control works in conjunction with the 'setup' and 'setups' controls.

Checked Use this setting to enable the board. Incoming data can be inserted into the transport stream, or used by a decoder.

Unchecked This setting disables the board.

Routing

Trunk

Use this control to specify the trunk on which the ASI or DS3 input is added.

VPI, VCI

Use these controls to specify the VPI and VCI values for the transport stream. These values can be used to route or decode programs as desired.

25.2.6 Config > Trunk # > Transport Stream Setups

This dialog is visible only when the FlexiCoder™ DVS is operating in ATM mode and a NIM-IO-ASI card is installed behind the main NIM-100 module. These controls configure the NIM-IO-ASI card acting, in this (ATM) mode as an input interface.

Use this dialog to select each setup that you want data entering the system via the ASI input to be a part of.

25.2.7 Config > Trunk # > Program # > Service # Properties Dialog

Incoming Program

Input PSI Program

Specifies the number of the MPEG-2 PSI program that this service should extract from the transport stream.

Input Port Type

Specifies the type of input port that the service uses.

ASI Use this setting if the program enters the TSI-IO-STD via an ASI port.

UDP Use this setting if the program enters the TSI-IO-STD via its Ethernet port.

Input Port Number

Use this control to assign an input to a service. Multiple services can use the same ASI input or UDP input port.

1-4 This range is available if the Input Port Type is set to 'ASI'.
In this context, the value selects the ASI port on the TSI-IO-STD that shall provide the specified service with input.

4901-4916 This range is available if the Input Port Type is set to 'UDP'.
In this context, the value specified identifies the UDP port that shall provide the service with input. Up to sixteen UDP ports may be used concurrently.

Specify Individual PIDs

Check this box if you want to specify individual video and audio input and output PIDs.
(Checking this box will set the Input PSI program to '0').

Input Audio/Video PID

Use these controls to identify input PIDs carrying audio and video.

Output Audio/Video PID

Use these controls to specify the output program's audio and video PIDs.

25.3 Network Output Branch

Abstract: *This branch of the configuration tree lists each trunk and each trunks related programs.*

25.3.1 Network Output > Bandwidth Tab

This tab provides a summary of all FlexiCoder™ DVS bandwidth usage.

25.3.2 Network Output > Routing Summary Tab

Active

Indicates if the module is active.

Output Enabled

Indicates if the module's output is enabled.

PSI Program Number

Indicate the Program System Information (PSI) number. This number uniquely identifies the program in the transport stream.

TS Total Bitrate (bps)

Indicates the total transport stream rate.

ATM Rate (bps)

Indicates the ATM rate which is the transport stream rate plus overhead created when the transport stream is encapsulated into ATM.

Trunk

Indicates the trunk to which the program contributes.

VPI, VCI

Indicates the VPI and VCI settings of the respective program.

Setups

These rows indicate any 'Setups' that output from the respective program may be a part of.

StatMux Group

Note: The rows in this section of this table may indicate values even if the StatMux feature is not enabled. These values are simply defaults.

Bias

Indicates the StatMux bias setting. This setting provides a general means to steer bits toward one encoder over another, for example a sports program over a new program.

Minimum Bitrate (bps)

Indicates the minimum bitrate for this encoder as it operates as part of a statmux group.

Maximum Bitrate (bps)

Indicates the maximum bitrate for this encoder as it operates as part of a statmux group.

Mode

Indicates the mode in which statmux is configured to operate.

Video PID

This section of the table indicates each of the PIDs over which the program's various elementary streams are configured to be transmitted.

25.3.3 Network Output > Trunk > Trunk Tab

Abstract: *This tab provides a summary of various trunk-related configuration settings.*

Auxiliary Data Bitrate (bps)
Indicates the configured rate for auxiliary data on the respective trunk.

Transport Stream ID
Indicates the Transport Stream ID (TSID) for the stream on the respective trunk.

Carousel Streaming

This section of the table indicates details about the trunk's Carousel settings.

Carousel Bitrate (bps)
Indicates the rate configured for this trunk's data carousel.

Path Name
Indicates the relative TFTP path to the carousel data files.

Chapter 26: FlexiCoder™ DVS Network Configuration

26

26.1 IP Network Configuration

26.1.1 Config > System > Network > IP Network Interface Properties

ATM IP Interface

These settings identify the FlexiCoder™ DVS's IP interface on an ATM network.

Note: All of the information on this screen is read-only. You must use the system's craft port to make any changes.

Control VPI and VCI (read-only)
These controls display the ATM virtual path identifier (VPI) and virtual circuit identifier (VCI) used for IP control.

IP Address (read-only)
This control displays the system's IP address on the ATM interface. This address must be configured for the local FlexiCoder™ DVS to communicate with other systems on an ATM ring.

IP Subnet Mask (read-only)
This control displays the system's IP subnet mask on the ATM interface. This address must be configured for the local FlexiCoder™ DVS to communicate with other systems on the ATM ring.

Ethernet IP Interface

These controls display the IP interface of the FlexiCoder™ DVS on an Ethernet network.

Ethernet Address (read-only)
This control displays the physical (MAC) address of associated with the FlexiCoder™ DVS Ethernet Port.

IP Address (read-only)
This control displays the system's IP address on the Ethernet interface. This address must be configured to use the Vidiem™ Element Management System to control the system.

IP Gateway (read-only)
This control displays the IP gateway address.

IP Subnet Mask (read-only)
This control displays the system's subnet mask on the Ethernet interface.

26.1.2 Config > System > Network > IP Services Properties

SNMP Trap Services

Trap Destinations (1-4)

These controls let you specify an IP address for each of up to four different trap receivers. When a trap is triggered, a trap message is sent to each of these receivers. If the receiving device is a Windows PC with the Vidiem Element Management System installed on it, then any traps received are presented in the trap log. Using Vidiem's menu bar, select 'Tools > Trap Log' to open the Trap Log display.

IP Services

SNMP Trap Manager

Set or check the trap IP address. The trap IP address identifies the IP address of the device that receives the FlexiCoder™ DVS trap messages.

TFTP File Server

Set or check the systems' TFTP file server address. The TFTP file server address identifies the IP address of the file server the FlexiCoder™ DVS should use to locate firmware files when upgrading. The TFTP file server address *must* be set in order to upgrade the system's firmware.

Time Server

Set or check the IP address of an external time server. Provided the time server address is valid and working correctly, the system regularly compares its local time with the time server's and makes any necessary corrections as specified in the NTP (Network Time Protocol). If no time server is specified, the time defaults to the system time saved in the FlexiCoder™ DVS.

26.2 Video Network Configuration

26.2.1 Config > System > Network > Video Network Properties

System Operation

Active Setup

This property specifies the active setup. Each 'Setup' is simply a list of programs that can be activated and de-activated together using this control. On the program side you can specify which setups each program may be a part of. See "Config > Trunk # > Program # > Program > Program Setups Dialog" on page 554 for details.

0 This control is ignored by the system. Programs are not controlled according to their setups information.

1-15 All programs with the selected number in the setups list are turned 'ON'.

Network Mode

Sets the system's operating mode to either ATM or Transport mode.

MPEG-2 Properties

Network PID

Specifies which transport stream packets contain the network information table (NIT).

0 Turns off all network messages.

1 to 8191 Identifies the PID containing the network information table.

System Variant

Specifies the type of PSI table format the system uses in the transport stream.

MPEG-2 System time messages are not transmitted in the transport stream.

Digicipher System time messages are transmitted in the transport stream.

ATSC System time messages are not transmitted in the transport stream.

26.3 ATM Network Configuration

26.3.1 Config > System > Network > Video Network > ATM Network Properties

Input Interface

Type

Use this control to identify the type of the ATM network input.

None Use this setting to receive ATM input.

PDH Use this setting to receive ATM input from a PDH source such as DS3 or E3.

SONET/SDH Use this setting to receive ATM input from a SONET or an SDH source such as OC3 (multi-mode or single mode), or STM1 or STM1e.

PDH Properties

Standard

Use this control to set the interface type, framing type, and operating mode. Each selection represents a combination of these three attributes.

Interface Type Sets the interface type as either DS3 or E3. This selection requires the appropriate hardware interface.

Framing Type Sets the framing type to either ADM (ATM direct-mapped), or PLCP.

Operating Mode The DS3 interface type can be further configured to use C-BIT parity or M23 compatibility mode.

Insert Line Buildout

Use this control to specify the DS3 output signal strength.

Checked Adds attenuation to the outgoing DS3 signal. Use this setting for cable lengths less than 200 feet.

Unchecked Does not add attenuation to the outgoing DS3 signal. Use this setting for cable lengths equal to or greater than 200 feet.

Active Inputs

Use this control to specify which inputs on the NIM-IO-PDH card are active.

SONET/SDH Properties

Standard

Sets the interface standard as either SONET or SDH.

Timing

Use this control to identify the SONET/SDH timing source.

Internal Sets the timing to an internal reference.

Loop Output timing is derived from the incoming SONET or SDH signal.

26.3.2 Overview of the FlexiCoder™ DVS ATM Routing Table

The ATM Routing Table acts as a filter for incoming ATM data. The ATM routing table filters data based on individual settings for each VCI. Select 'System > Network > ATM Routing Table (tab)' to access the table.

ATM Routing Table Rules

- You must create an entry in the ATM Routing Table for each VCI of interest on the system's ATM input.
- Cells on incoming VCIs that are not in the ATM Routing Table is discarded.
- For each VCI in the table, you must define a destination (Trunk 1 or Trunk 2).
- The ATM Rate field provides a means to accurately estimate the amount of backplane bandwidth consumed on each trunk. See "How to Add One or More ATM Routing Table Entries" on page 590 for details.)

Behavior for NIM-IO-MM, NIM-IO-SM, NIM-IO-STM I/O Boards

Trunk 1	Cells are routed through the system and retransmitted on the ATM output interface.
Trunk 2	Cells are routed through the system but not retransmitted on the ATM output interface. Use this selection to route a transport stream to a local decoder only.

Behavior for NIM-IO-PDH I/O Boards

Trunk 1	Cells are routed through the system and retransmitted on the DS3A output interface.
Trunk 2	Cells are routed through the system and retransmitted on the DS3B output interface.

Note: The ATM routing table does not recognize VPI numbers, but the VPI numbers are preserved in the system. Therefore, the routing table directs virtual channels with the same VCI but different VPIs to the same destination.

Note: Local decoders do recognize VPIs so that a specific stream can be decoded.

Note: The routing table cannot distinguish between DS3A IN and DS3B IN on the NIM-IO-PDH.

26.4 ATM Routing Table Procedures

26.4.1 How to Add One or More ATM Routing Table Entries

1. Select 'System > Network' in the Navigation pane.
2. Select the 'ATM Routing' tab.
3. Right-click on any cell in the 'Destination' column and select ADD from the pop-up menu.
4. In the 'Add VCI Routing Entries' dialog, select one VCI or a range by number as desired.
5. Select the destination trunk for each VCI.
6. Specify the ATM Rate for each VCI. This value represents the amount of bandwidth entering the system through this VCI. Vidiem™ uses this value for each VCI in the 'Network Output' view to present calculations of consumed and remaining trunk bandwidth. The Network Output view presents a smaller rate calculation for each VCI than that entered in the 'ATM Rate' field. The difference between these two numbers is due to the subtraction of ATM overhead.

26.4.2 How to Highlight a Range of ATM Routing Table Cells

1. Left click and drag to highlight multiple cells.
2. Right click to edit these highlighted cells.

26.4.3 How to Edit FlexiCoder™ DVS ATM Routing Table Entries

1. In the Navigation pane, select 'System > Network', and select the 'ATM Routing' tab.
2. Highlight a cell in the destination column and select 'Properties' from the pop-up menu.
3. In the 'VCI Routing Destination' dialog, select one entry or a range and right click.
4. Select a new trunk destination or specify a new ATM rate as desired.
5. Select 'OK'.

26.5 Video Transport Stream Network Configuration

26.5.1 Config > System > Network > Video Network > Transport Stream Network Properties

Output Interface

Type

Specifies the format of the transport stream output.

Interface Properties

Insert Line Buildout

Use this control to specify the DS3 output signal strength.

Checked Adds attenuation to the outgoing DS3 signal. Use this setting for cable lengths less than 200 feet.

Unchecked Does not add attenuation to the outgoing DS3 signal. Use this setting for cable lengths equal to or greater than 200 feet.

DVB-ASI Trunk Rate (bps)

Use this control to specify the bit rate of the output transport stream when using either the NIM-IO-ASI, or the NIM-IO-4ASI interface (bits/sec).

Note: When using the NIM-IO-4ASI the specified rate is applied to each of the four outputs.

Number of Trunks

Use this control to specify the number of active trunks in the system.

See Table 26-1, "Maximum Trunk and Interface Rates" on page 592 for the allowable number of trunks that may be used according to the system's mode and Output Interface (IO) settings. The number of outputs is dependent on the type of Output Interface.

MPEG-2 Packet Length

Sets the DVB cell packet length in bytes.

26.5.2 FlexiCoder™ DVS Interface Data Rates

Table 26-1 Maximum Trunk and Interface Rates

Interface Format	Usable Transport Stream Rate Per Port	Maximum Number of Trunks	Transport Packet Mapping
I/O Card: NIM-IO-310 Format: SMPTE 310M (ATSC)	19.39 Mbps	2	Direct mapping
I/O Card: NIM-IO-ASI Format: DVB-ASI	108 Mbps	1	Direct mapping
I/O Card: NIM-IO-ASI Format: DS3	44.209 Mbps	1	Direct mapping
I/O Card: NIM-IO-4ASI Format: DVB-ASI	130 Mbps/ # of ports	1, 2, 4	Direct mapping
I/O Card: NIM-IO-DHEI Format: DHEI	27 Mbps	4	Direct mapping
I/O Card: NIM-IO-PDH Format: ATM DS3 PLCP	36.096 Mbps	2	Transport Stream Packet > AAL-5 PDU > ATM cells => PLCP frame
I/O Card: NIM-IO-PDH Format: ATM DS3	39.205 Mbps	2	Transport Stream Packet > AAL-5 PDU > ATM cells (Direct Map)
I/O Card: NIM-IO-PDH Format: G.751 E3	29.966 Mbps	2	Transport Stream Packet > AAL-5 PDU > ATM cells (Direct Map)
I/O Card: NIM-IO-PDH Format: G.751 E3	27.072 Mbps	2	Transport Stream Packet > AAL-5 PDU > ATM cells => PLCP frame
I/O Card: NIM-IO-PDH Format: G.832 E3	29.575 Mbps	2	Transport Stream Packet > AAL-5 PDU > ATM cells
I/O Card: NIM-IO-MM or SM Format: STM-1o OC3 MM & SM	125.0 Mbps	1	Transport Stream Packet > AAL-5 PDU > ATM cells
I/O Card: NIM-IO-STM Format: STM-1e	125.0 Mbps	1	Transport Stream Packet > AAL-5 PDU > ATM cells

26.5.3 Config > Set Time

Use the controls in this dialog to set the system time and date.

Press the Set Time button after making any changes.

The time is changed immediately.

26.5.4 Config > Reset System Alarms

Use this dialog to Reset different system alarms grouped by severity.

26.5.5 Config > System > Slot # Module Properties

Module Type

Front, Rear

These indicate the type of main module (front) and I/O card (rear) installed in the selected slot.

Redundancy

Use As Backup

Check this control to make the board in the selected slot the backup for all other boards of the same type and in the same backup group.

Note: More than one module can be designated as the backup for a group.

Belongs to Router Group

Use this control to associate or disassociate the module in the selected slot with the specified backup group.

0 Disassociates the module from any other backup group. This is the default setting for each slot.

1-15 Associates the module with the selected backup group.

Control Router (checkbox)

Check this box to designate the module in the selected slot as a controller for an external router. The selected module must have a serial connection to the router. In the event that a module in the same group fails, the router controller issues commands to reconfigure the router. The router then switches signals from the failed module to the backup module.

IP Communication

The IP communication settings in this dialog are for use with TSI-100, and MMC-100 modules only. Other modules ignore these settings. The NIM-100 module's IP address is configured exclusively through a craft port connection.

Note: These IP address settings are applied to the *slot* containing the specified module; they *do not* travel with the module if it is moved to another slot.

IP Address

Sets the IP address of the module in the selected slot.

IP Subnet Mask

Sets the IP Subnet Mask of the module in the selected slot.

IP Gateway

Sets the IP Gateway Address of the module in the selected slot.

Use DHCP (checkbox)

Check this box if your network provides DHCP support and you wish to use DHCP to configure the TSI-100's IP address, subnet mask, and gateway.

26.6 ASI I/O Module Procedures

26.6.1 How to Create an ASI Encoding Session

1. Create an encoding session. See "How to Create a FlexiCoder™ DVS Encoding Session" on page 543 for details.
2. Open 'System > Network' in the navigation tree.
3. Double-click on 'Network'. Vidiem™ opens the System Properties dialog box.
4. Open 'Network > Video' Network in the navigation tree.
    - Select 'Transport Stream' as the Network Mode.
5. Open 'Network > Video Network > Transport Stream' in the navigation tree.
    - Select 'DVB-ASI' as the Type.
    - Click OK.
6. Open 'Network Output > Trunk 1 > NIM-IO-ASI'.
    - Double-click NIM-IO-ASI. Vidiem™ opens the 'Transport Input Properties' dialog box.
    - Select 'DVB-ASI' as the Format.
    - Check the 'Enable Output' checkbox.
    - Set the VCI and VPI.
    - Click 'OK'.
7. Click the 'Write Device' icon on the menu bar.
8. Select 'Devices > Save'.

26.6.2 How to Create a FlexiCoder™ DVS ASI Decoding Session

1. Expand 'Decoding' in the navigation pane.
2. Double-click on the slot number of a decoding session. The 'Decoder Properties' dialog box opens.
    - Set the 'Source' to Network.
    - Set the appropriate PSI Program Number, VCI and VPI for the program you wish to decode.
    - Click on 'OK'.
3. Open 'Network Output > Trunk # > NIM-IO-ASI'.
    - Double-click on 'NIM-IO-ASI'. The Vidiem™ Element Management System opens the 'Transport Input Properties' dialog box.
    - Select the 'DVB-ASI' Format.
    - Set the appropriate VCI and VPI (these should match the VCI/VPI of the decoding session and of the program coming into the NIM).
    - Click on 'OK'.
4. Click on the 'Write Device' icon on the menu bar.
5. Select 'Devices > Save'.

Chapter 27: FlexiCoder™ DVS Module Redundancy

27

27.1 Overview of FlexiCoder™ DVS Module Redundancy

You can assign a backup (or redundant) module for any type of FlexiCoder™ DVS main module except for the MMC-100.

The following three things take place when a system is configured with redundant main modules and a module failure occurs.

- The service on the failed module switches to the next available module of the same type that is designated as a backup and that is in the same backup group.
- The backup module automatically configures itself identically to the failed unit and changes its designation from backup to main.
- The system sends a trap over the SNMP interface indicating that a fail-over has occurred, and deletes the slot configuration of the failed module.

Until a module failure actually occurs, modules that are designated as backup modules operate normally and can be used to carry low-priority services.

Note: For wiring information, see the chapter titled 'Redundancy' in the FlexiCoder™ DVS's Installation and Operation Manual that was shipped with your system firmware.

27.2 FlexiCoder™ DVS Module Redundancy Procedures

27.2.1 How to Assign a FlexiCoder™ DVS Module to a Backup Group

1. Open the Vidiem™ Element Management System.
2. Upload the current system context by clicking on the 'Read Device' icon in the menu bar.
3. Click on 'System' in the navigation tree.
4. Click on the 'Module' tab.
5. Double-click on the module you wish to configure. The Vidiem™ Element Management System opens the 'Module' dialog box.
6. Check the 'Belongs to Router Group' checkbox.
7. Select the number of the backup group you wish to assign the module to.
8. Repeat Step 6 through Step 8 for each module you wish to assign to a backup group.
9. Click on 'OK'.
10. Download the system context by clicking on the 'Write Device' icon in the menu bar.

27.2.2 How to Configure a FlexiCoder™ DVS Module to Serve as a Backup Module

1. Open the Vidiem™ Element Management System.
2. Upload the current system context by clicking on the 'Read Device' icon in the menu bar.
3. Click 'System' in the navigation tree.
4. Click the 'Module' tab.
5. Double-click on the module you wish to configure. The Vidiem™ Element Management System opens the 'Module' dialog box.
6. Check the 'Enable Use As Backup' checkbox.
7. Assign the module to a backup group. See "How to Assign a FlexiCoder™ DVS Module to a Backup Group" on page 595 for details.
8. Check the 'Controls Router' checkbox in the 'Module' dialog box if you wish this module to act as the router control module.
9. Click on 'OK'. In the configuration view the small green bar to the right of (VS-5), or under (VS-21), the image of the module appears half-full and has the letter B underneath it.
10. Download the system context by clicking on the 'Write Device' icon in the menu bar.

27.2.3 How to Recover a FlexiCoder™ DVS NIM from a Failover

1. Replace the failed module and allow it to boot. The SYS light turns green when the module has booted.
2. Open Vidiem™ to the device view.
3. Upload the current system context by clicking on the 'Read Device' icon in the menu bar.
4. Click on the small box above the image of the NIM. A check mark appears in the box.
5. Click on the 'Reset' button.
6. Click on 'Selected Modules'.
7. Click on 'Reset'.

27.2.4 How to Recover a FlexiCoder™ DVS E

Abstract: *Encoder or Decoder from a Failover*

1. Replace the failed module and allow it to boot. The SYS light turns green when the module has booted.
2. Double-click on the device name located at the highest level of the navigation tree.
3. Click on the image of the redundant module that picked up service from the failed module. This is the module that was originally designated as the backup module before the failover occurred.
4. In the 'Dynamic Control' dialog box select the replacement module from the 'Destination' drop-down list.
5. Click on 'Transfer'
6. Press 'yes', when prompted, to confirm the transfer.
7. Click 'OK'.
8. Re-assign the redundant module as a Backup. See "How to Configure a FlexiCoder™ DVS Module to Serve as a Backup Module" on page 595 for details.
9. Download the system context by clicking on the 'Write Device' icon on the menu bar.

27.2.5 How to Transfer Service Between Like Modules

1. Click on the device name at the highest level of the navigation tree.
2. Click on the image of the module from which you want to transfer service. Vidiem™ opens the 'Transfer Service' dialog.
3. Use the drop down list to select the module that shall receive the service. Vidiem™ ensures that only like modules are available for selection.
4. Click the 'Transfer' button to transfer the service.
5. Click 'OK' to exit this screen.

Chapter 28: FlexiCoder™ DVS Utility Operations 28

28.1 FlexiCoder™ DVS System and Module Reset

28.1.1 How to Reset the FlexiCoder™ DVS System

1. Double-click on the device name located at the highest level of the navigation tree.
2. Click the 'Reset' button. The Vidiem™ Element Management System opens the 'Reset' dialog box.
3. Click on 'Entire System'.
4. Click on the 'Reset' button.
5. Click 'Yes' to confirm.

28.1.2 How to Reset FlexiCoder™ DVS Modules

1. Double-click on the device name located at the highest level of the navigation tree.
2. Place a check in the check-box near the image of each module that you want to reset.
3. Click the 'Reset' button.
4. Choose the 'Selected Modules' option.
5. Click on the 'Reset' button.
6. Click the 'Yes' button to confirm.

28.2 FlexiCoder™ DVS Program Setups

28.2.1 Overview of Program Setups

The FlexiCoder™ DVS's 'Setup' feature provides a convenient way to control data entering the FlexiCoder™ DVS's backplane. You can use the 'Setup' feature to control

- The output from one or more encoding channels entering the backplane.
- The output from a NIM-IO-ASI card entering the backplane.

The basic idea behind the 'Setup' feature is that you can create a list of up to 15 'setups' for each encoder and each NIM-IO-ASI card. Use the 'Active Setup' control in the 'Video Network Properties' dialog to specify the setup that should become active. Any program or input with the 'Active Setup' value in its list of 'setups' will become active (provided that its output is enabled).

28.2.2 How to Add an Encoding Program to a Setup

Use this procedure to add locally encoded programs to one or more setups. 'Locally encoded' means programs encoded on an encoder within the system.

Perform steps 1 and 2 on each program that you want to control using the Setup feature.

1. Right-click on any encoding program and select 'Properties' from the drop down.
2. In the 'Categories:' tree, select 'Programs > Setups'
3. Place a check mark next to each Setup that you want the current program to be a part of.
4. Go to 'Network Output > Trunk # > Program # > Program (tab)' and ensure that 'Output Enabled' is set to 'ON'.
5. Go to 'System > Network > Video Network (tab)' and double click 'Active Setup'. This action open the dialog.
6. Use the drop down to select the Setup you want to make active. All programs in that setup will become active. Use this control to change the active setup at any time.

Note: All programs that are not part of the active setup are turned OFF.

28.2.3 How to Add NIM-IO-ASI Input to a Setup

Use this procedure to add input, from the NIM-IO-ASI board's ASI or DS3 interface, to one or more setups.

Note: The NIM-IO-ASI board's DS3 interface uses direct-map DS3.

1. In the Navigation Pane, expand 'Network Output', then expand the trunk that the NIM-IO-ASI is located on.
2. Right-click on NIM-IO-ASI and select 'Properties' from the drop down.
3. In the 'Categories:' tree, select 'Setups'.
4. Place a check mark next to each Setup that you want the NIM-IO-ASI input to be a part of.
5. In the 'Categories:' tree, select 'Interface' and ensure that 'Output Enabled' is set to 'ON'.
6. Go to 'System > Network > Video Network (tab)' and double click 'Active Setup'.
   This action opens the Video Network Properties dialog. See "Config > System > Network > Video Network Properties" on page 587 for details.
7. Use the drop down to select the Setup you want to make active. All programs in that setup will become active.
   Use this control to change the active setup at any time.

28.2.4 Config > System > System Fundamentals Dialog

Enclosure Type

If modifying a configuration file, select the proper enclosure type from the drop-down menu.

If working with a configuration read from a device, the system indicates the enclosure type.

Load Firmware Automatically

Enables automatic download of all firmware. This will occur when the system is reset or powered down and restarted.

Path Name

Sets the firmware path and filename. After changing this setting, be sure to:

- Write the change to the system by selecting 'Device > Write' from the menubar.
- Save the firmware path to the system's non-volatile memory by selecting Device > Save.

If the firmware pathname is correctly set and 'Load Firmware Automatically' (above) is checked, then the next time the system is reset, or powered down and restarted, it will automatically load firmware from the location specified.

Perform ISP Automatically

Enables In-System Programming (ISP) of board hardware during upgrade.

Version (read-only)

This display shows the version of firmware currently running on the system.

28.2.5 Config > System > System Fundamentals > Feature Authorization Dialog

Abstract: *Use the controls in this dialog to set the Feature Authorization key.*

1. Enter the feature authorization key in the space provided.
2. After entering the key, press this button to set the feature authorization key.

Chapter 29: FlexiCoder™ DVS Trap Descriptions 29

29.1 Overview of FlexiCoder™ DVS Traps

This chapter provides a description of each alarm and trap message that the FlexiCoder™ DVS may issue. The FlexiCoder™ DVS provides the following classes of alarm notification.

29.2 FlexiCoder™ DVS Trap Variable Definitions

This section describes the variables displayed in each NetVX (DVS) trap message.

29.2.1 Trap Count Number

This variable provides a counter that is maintained by the system controller and is increased by '1' whenever a new trap is sent. This counter is set to '0' whenever the NIM system controller is reset, powered up, or service switched.

This count is maintained by each NIM controller. Therefore, if you monitor more than one system, you may receive identical count numbers.

29.2.2 Trap Event Code

This variable indicates the event code associated with a trap.

0 - Used for generic events.

Non-zero - Used if the failure-type is known. Event code tables are provided in the description of each trap in which a non-zero event code is used.

29.2.3 Module Type

This variable indicates the type of module (video encoder or decoder, etc.) associated with a trap. Valid values are:

0 - None
1 - NIM-100
2 - EVA-100
3 - QDEC-100
4 - QDEC-110
5 - AXP-100
6 - HDC-100
7 - HDEC-100
8 - EVA-200
9 - EVA-110
10 - (unused)
11 - HDP-100
12 - QDEC-120
13 - MMC-100
14 - EVA-150
15 - EVA-200A
16 - EVA-150A
17 - EVA-152
18 - EVA-210

19 - (unused)
20 - (unused)
21 - TSI-100
22 - EVA-162

29.2.4 Slot Number

This variable indicates the slot number associated with a trap. If the trap has two slots, such as a service switch, this item specifies the slot ***from*** which the service was removed.

29.2.5 Trap Channel Number

This variable helps report a condition specific to a channel. Used with the slot number, it uniquely identifies the affected channel.

29.2.6 Trap To Slot Number

This variable indicates the slot number ***to*** which the service was switched.

29.2.7 Trap ATM Network Type

When an ATM network trap occurs, this variable indicates the network type. Valid values are:

0 - None
1 - OC3
2 - DS3A
3 - DS3B

29.2.8 Trap Cleared Trap Counter

When a trap occurs, the current Trap Count Number value identifies that trap. If the system later sends a CLEAR trap for the condition, this value repeats the original Trap Count Number as an identifier and thus replaces the original trap message in the trap monitor display.

29.2.9 Trap IP Address

If a trap is associated with access to an IP address, this variable gives the address.

29.2.10 Trap Time Delta

When the system has to reset its clock, this variable tells how many seconds the new and old clocks differ. By convention, the value is (new - old).

29.2.11 Trap Module Trap ID

When a module trap occurs, the module creates a value to identify that trap.

29.2.12 Trap Cleared Trap ID

When a module sends a CLEAR trap, this value repeats the original Trap Module Trap ID value.

29.2.13 Trap Port Number

The port number associated with a transport stream module trap.

29.3 Trap and Alarm Types

Trap Name: **Cold Start Trap**
MIB Numbers: None
Variables: None
Description: This trap indicates that the system is re-initializing itself and that its configuration may have been altered.
Corrective Action(s): None required.

Trap Name: **Board Removed**
MIB Numbers: 1
Variables: Trap Count Number: [Value 1]
Module Type: [Value 3]
Slot Number: [Value 4]
Description: This trap is issued when module removal is detected.
Corrective Action(s): None required.

Trap Name: **Board Inserted**
MIB Numbers: 2
Variables: Trap Count Number: [Value 1]
Module Type: [Value 3]
Slot Number: [Value 4]
Description: This trap is issued when module insertion is detected.
Corrective Action(s): If the module is a new module, provision the new module.

Trap Name: **Module Failure**
MIB Numbers: 3

Variables: Trap Count Number: [Value 1]
Trap Event Code: [Value 2] (see key below)
Module Type: [Value 3]
Slot Number: [Value 4]

Description: This trap is issued when a module failure is detected.

Event Code Key

The Event Code for this trap identifies the cause of the module failure.

0 - Unknown failure type.
1 - Required firmware missing
2 - FPGA load failure
3 - ISP load failure
4 - System Layer (DSP/MSLD) failure
5 - Audio processor boot failure
6 - Video microcode load failure
7 - Video encoder initialization failure
8 - I/O board failure
9 - IPC/VIP preprocessor failure
124 - I/O card needs to perform In Service Programming (ISP)
125 - User exit to maintenance mode
126 - Module resetting
127 - Software initialization error

Corrective Action(s):
1 If the failed module is an AXP-100 module, use the following directions to ensure that the EVA modules associated with the failed AXP-100 channels will continue to encode video correctly.
2 Un-associate each audio channel on the failed AXP-100 from the video with which it is associated.
3 Reset the EVA modules corresponding to each of the affected video channels.
4 If the reset does not fix the problem, replace the failed module.

Trap Name: **Board Change of State**

MIB Numbers: 4

Variables: Trap Count Number: [Value 1]
Trap Event Code: [Value 2] (see key below)
Module Type: [Value 3]
Slot Number: [Value 4]

Description: This trap is issued when a module change of state is detected (i.e. when a module goes from non-operational to operational, etc.).

Event Code Key

The Event Code for this trap identifies the new state of the module.

0 - Offline
1 - Upgrading
2 - Initializing
3 - Testing
4 - Operational
5 - Re-configuring
6 - Performing ISP

Corrective Action(s): None Required.

Trap Name: **Controller Switched**
MIB Numbers: 5
Description: Trap Count Number: [Value 1]
Variables: This trap is typically issued when the system's a different NIM controller is designated as the main controller. This trap may be issued when the Main NIM controller fails and the backup NIM controller takes over, or when there is a manual switch of NIM controllers.
Corrective Action(s):
1 Replace the failed NIM-100 module in slot 1.
2 Configure the NIM-100 module in slot 1 as the active NIM by resetting* the NIM in slot 2. The NIM-100 module in slot 2 will become the standby NIM.

*NOTE: Resetting an active NIM-100 module will cause a system service outage of less than 1 minute.

Trap Name: **Service Switched**
MIB Numbers: 6
Variables: Trap Count Number: [Value 1]
Module Type: [Value 3]
Slot Number (from): [Value 4]
Slot Number (to): [Value 5]
Description: This trap is issued when one of the MAIN modules fails and its service is switched to a BACKUP module.
Corrective Action(s):
1 Failed module should be replaced.
2 Service should be switched to replacement module.
3 Redundant module should be re-configured as Standby.

Trap Name: **Link LOS Raise**
MIB Numbers: 7
Variables: Trap Count Number: [Value 1]
Trap ATM Network Type: [Value 2]
Module Type: [Value 3]
Slot Number: [Value 4]
Description: This trap is issued when Loss Of Signal (LOS) is detected on whichever of the OC3, DS3A, DS3B, E3, STM1e, or STM-1o connections is configured for ATM input.
Corrective Action(s):
1 Check the network connection.
2 Check the integrity of cable.

Trap Name: **Link LOS Clear**
MIB Numbers: 8
Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]
Description: This trap is issued when a previously reported OC3, DS3A, or DS3B Loss of Signal state has cleared.
Corrective Action(s): None Required.

Trap Name: **Link Bit Err Raise**
MIB Numbers: 9

Variables: Trap Count Number: [Value 1]
Trap ATM Network Type: [Value 2]
Module Type: [Value 3]
Slot Number: [Value 4]

Description: This trap is issued when various Bit Errors are detected on whichever of the OC3, DS3A, or DS3B connections is configured for ATM input.

Corrective Action(s):
1 Check the network connection.
2 Check the integrity of cable.

Trap Name: **Link Bit Err Clear**

MIB Numbers: 10

Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]

Description: This trap is issued when a previously reported OC3, DS3A, or DS3B Bit Error state has cleared.

Corrective Action(s): None Required.

Trap Name: **Link RDI Raise Trap**

MIB Numbers: 11

Variables: Trap Count Number: [Value 1]
Trap ATM Network Type: [Value 2]
Module Type: [Value 3]
Slot Number: [Value 4]

Description: This trap is issued when a Remote Defect Indication (RDI) is reported on whichever of the OC3, DS3A, or DS3B connections is configured for ATM input. This alarm indicates errors in 'upstream' equipment sending signals to this system.

Corrective Action(s): None Required.

Trap Name: **Link RDI Clear Trap**

MIB Numbers: 12

Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]

Description: This trap is issued when a previously reported OC3, DS3A, or DS3B Remote Defect Indicator (RDI) state has cleared.

Corrective Action(s): None Required.

Trap Name: **Link AIS Raise**

MIB Numbers: 13

Variables: Trap Count Number: [Value 1]
Trap ATM Network Type: [Value 2]
Module Type: [Value 3]
Slot Number: [Value 4]

Description: This trap is issued when a remote Alarm Indicator State (AIS) is reported on whichever of the OC3, DS3A, or DS3B connections is configured for ATM input. This alarm indicates errors in 'downstream' equipment receiving signals from this equipment.

Corrective Action(s): None Required.

Trap Name: **Link AIS Clear**
MIB Numbers: 14
Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]
Description: This trap is issued when a previously reported OC3, DS3A, or DS3B remote Alarm Indicator State has cleared.
Corrective Action(s): None Required.

Trap Name: **ATM Error Raise**
MIB Numbers: 15
Variables: Trap Count Number: [Value 1]
Trap ATM Network Type: [Value 2]
Module Type: [Value 3]
Slot Number: [Value 4]
Description: This trap is issued when an ATM layer protocol error is detected (e.g. CRC error, loss of ATM cell delineation).
Corrective Action(s): 1 Check the network connection.
2 Check cable integrity.

Trap Name: **ATM Error Clear Trap**
MIB Numbers: 16
Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]
Description: This trap is issued when a previously reported ATM layer protocol error has cleared.
Corrective Action(s): None Required.

Trap Name: **Bandwidth Raise Trap**
MIB Numbers: 17
Variables: Trap Count Number: [Value 1]
Trap ATM Network Type: [Value 2]
Module Type: [Value 3]
Slot Number: [Value 4]
Description: This trap is issued when a FIFO overflow is detected that indicates insufficient available network bandwidth.
Corrective Action(s): Verify that bandwidth provisioning is within allowable limits for network interface and number of trunks.

Trap Name: **Bandwidth Clear Trap**
MIB Numbers: 18
Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]
Description: This trap is issued when a previously reported bandwidth error has cleared.
Corrective Action(s): None Required.

Trap Name: **NIM Error Raise**
MIB Numbers: 19

Variables: Trap Count Number: [Value 1]
Trap ATM Network Type: [Value 2]
Module Type: [Value 3]
Slot Number: [Value 4]

Description: This trap is issued when the NIM CPU is unable to transmit data on the system backplane.
This is most likely occur when the system is configured to operate in transport mode with an I/O board, and there is not an I/O board behind the NIM module.
This may also occur when a NIM I/O board is initializing.

Corrective Action(s):
1 Ensure the I/O board is installed behind the active NIM.
2 If the I/O board is installed, use the 'status' command at the craft port to check if the board is initializing.

Trap Name: **NIM Error Clear**
MIB Numbers: 20
Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]
Description: This trap is issued when a previously reported NIM module processing error has cleared.
Corrective Action(s): None Required.

Trap Name: **System Error Raise**
MIB Numbers: 21
Variables: Trap Count Number: [Value 1]
Trap ATM Network Type: [Value 2]
Module Type: [Value 3]
Slot Number: [Value 4]
Description: This trap is issued when a network related error is detected that indicates some system processing error.
Corrective Action(s): None Required.

Trap Name: **System Error Clear**
MIB Numbers: 22
Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]
Description: This trap is issued when a previously reported system error has cleared.
Corrective Action(s): None Required.

Trap Name: **Time Error Raise Trap**
MIB Numbers: 23
Variables: Trap Count Number: [Value 1]
Trap IP Address (time server's IP address): [Value 2]
Description: This trap is issued when the time server is unreachable.
Corrective Action(s): Verify that the IP address of the time server is correct.

Trap Name: **Time Error Clear Trap**
MIB Numbers: 24

Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]
Trap IP Address (time server's IP address): [Value 3]
Description: This trap is issued when the time server becomes available after it previously was unreachable.
Corrective Action(s): None Required.

Trap Name: **Time Clock Reset Trap**
MIB Numbers: 25
Variables: Trap Count Number: [Value 1]
Trap Time Delta: [Value 2]
Description: This trap is issued when the system resets its clock. This may happen because of human intervention or through communication with the time server.
Corrective Action(s): None Required.

Trap Name: **Firmware Invalid Trap**
MIB Numbers: 26
Variables: Trap Count Number: [Value 1]
Trap Event Code: [Value 2] (see key below)
Description: This trap is issued when the system finds invalid firmware during its initialization.

Event Code Key

The Event Code for this trap identifies cause of the module failure.
0 - Unknown failure type.
1 - Required firmware missing
2 - FPGA load failure
3 - ISP load failure
4 - System Layer (DSP/MSLD) failure
5 - Audio processor boot failure
6 - Video microcode load failure
7 - Video encoder initialization failure
8 - I/O board failure
9 - IPC/VIP preprocessor failure
124 - I/O card needs to perform In Service Programming (ISP)
125 - User exit to maintenance mode
126 - Module resetting
127 - Software initialization error

Corrective Action(s):
1 Check the IP address of TFTP server.
2 Check that the firmware path name is correct.
3 Check permissions on the firmware files.

Trap Name: **Firmware Valid Trap**
MIB Numbers: 27
Variables: Trap Count Number: [Value 1]
Description: This trap is issued when the system finds valid firmware during its initialization.
Corrective Action(s): None Required.

Trap Name: **Video LOS Raise Trap**
MIB Numbers: 28
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Channel Number: [Value 3]
Trap Module Trap ID: [Value 4]
Description: This trap is issued when the system detects a loss of video signal to an encoder.
Corrective Action(s): 1 Check the video input connections.
2 Check the video source.

Trap Name: **Video LOS Clear Trap**
MIB Numbers: 29
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap ID: [Value 3]
Description: This trap is issued when a previously reported loss of video signal error is cleared.
Corrective Action(s): None Required.

Trap Name: **Audio LOS Raise Trap**
MIB Numbers: 30
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Channel Number: [Value 3]
Trap Module Trap ID: [Value 4]
Description: This trap is issued when the system detects a loss of audio signal to an encoder. The system can detect this condition only for digital input.
Corrective Action(s): 1 Check the encoder's audio input connections.
2 Check the audio source. Ensure that an audio signal is present.

Trap Name: **Audio LOS Clear Trap**
MIB Numbers: 31
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap ID: [Value 3]
Description: This trap is issued when a previously reported loss of audio signal error is cleared.
Corrective Action(s): None Required.

Trap Name: **Decode Audio LOS Raise Trap**
MIB Numbers: 32

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Channel Number: [Value 3]
Trap Module Trap ID: [Value 4]

Description: This trap is issued when the system detects a loss of signal to a decoder.

Corrective Action(s): **Case 1: The encoder and decoder are located in the different enclosures.**

1 Check that the encoder/decoder settings are consistent with one another: VCI, PSI program number, trunk number.
2 Check the I/O network connections to the NIM-100 controller in both systems.
3 Check each of the video and audio input signal connections to the encoder.
4 Check that each board in the encoder shelf that transmits ATM cells to the backplane is correctly configured.
5 Check that all physical connections are good. If the encoder is not generating an LOS condition, and the encoder shelf is configured correctly, and if each of the items above have been checked, then assume the encoder is receiving good input but putting out corrupt video data or no data and replace the encoder board.

Corrective Action(s): **Case 2: The encoder and decoder are located in the same enclosure.**

1 Check that a signal is present on any other decoder channels receiving the same encoded video data. If (a) The encoder is not generating a LOS condition and, (b) The encoder system is configured correctly, then assume the encoder is receiving good input but putting out corrupt video data or no data and replace the encoder board.
2 If all connections to the system have been checked and appear OK, then replace the decoder board.

Trap Name: **Decode Audio LOS Clear Trap**

MIB Numbers: 33

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap ID: [Value 3]

Description: This trap is issued when a previously reported loss of audio signal error is cleared.

Corrective Action(s): None Required.

Trap Name: **ATM Output Error Raise Trap**

MIB Numbers: 34

Variables: Trap Count Number: [Value 1]
Trap ATM Network Type: [Value 2]
Module Type: [Value 3]
Slot Number: [Value 4]

Description: This trap is issued when the system is receiving ATM cells but is not transmitting them. (This may be a normal condition if the system contains only decoders.)

Corrective Action(s):

1 Check settings on all encoder boards in shelf.
2 Check system-level parameters (operating mode, networking).
3 Failover to Standby NIM board.

Trap Name: **ATM Output Error Clear Trap**

MIB Numbers: 35

Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]

Description: This trap is issued when a previously reported ATM output error has cleared.

Corrective Action(s): None Required.

Trap Name: **HDC Module Error Raise Trap**
MIB Numbers: 36
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Channel Number: [Value 3]
Description: This trap is issued when an HDC Module is re-configured.
Corrective Action(s): None Required.

Trap Name: **HDC Module Error Clear Trap**
MIB Numbers: 37
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap ID: [Value 3]
Description: This trap is issued when a previously reported HDC module is cleared.
Corrective Action(s): None Required.

Trap Name: **Power Fail Raise Trap**
MIB Numbers: 38
Variables: Trap Count Number: [Value 1]
Trap Event Code: [Value 2] (see key below)
Description: This trap is issued when a power supply failure is detected.

Event Code Key

The Event Code for this trap identifies a failed power supply.

3 - Power supply 'A'

5 - Power supply 'B'

Corrective Action(s):

1 Verify that the power supply connections are properly connected.
2 Verify that the input voltage is correct.
3 Check if the fuse or circuit breaker is blown.
4 The power supply replacement procedure is described in the 'Reference Manual' that was delivered with your system. On the WS-5 you can visually identify the power supply that is not operating by checking the LED next to the power switch.
5 Replace the power supply if necessary.

Trap Name: **Power Fail Clear Trap**
MIB Numbers: 39
Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]
Description: This trap is issued when a previously reported failed power supply returns to normal operational status.
Corrective Action(s): None Required.

Trap Name: **Fan Fail Raise Trap**
MIB Numbers: 40

Variables: Trap Count Number: [Value 1]
Trap Event Code: [Value 2] (see key below)

Description: This trap is issued when a fan failure is detected.

Event Code Key

The Event Code for this trap identifies one or more failed fans.

3 - Fan 'A' - (Check for exhaust airflow at the rear of the unit to identify.)

5 - Fan 'B' - (Check for exhaust airflow at the rear of the unit to identify.)

7 - Both fans.

Corrective Action(s):

1 The fan replacement procedure is described in the 'Installation and Operation Manual' that was delivered with your system. Visually identify the fan that is not operating and replace it.

2 If the Event Code is '7' then both fans have failed and you should shut the system down to prevent overheating.

Trap Name: **Fan Fail Clear Trap**

MIB Numbers: 41

Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]

Description: This trap is issued when a previously reported failed fan supply returns to normal operational status.

Corrective Action(s): None Required.

Trap Name: **Video Error Raise Trap**

MIB Numbers: 42

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Channel Number: [Value 3]
Trap Module Trap ID: [Value 4]

Description: This trap is issued when the system detects a 'bad' video signal to an encoder. 'Bad', in this context, means that the signal is not framed correctly, or it has data errors.

Corrective Action(s): Check that the video input signal type and the respective provisioning match.

Trap Name: **Video Error Clear Trap**

MIB Numbers: 43

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap ID: [Value 3]

Description: This trap is issued when a previously reported bad video signal error is cleared.

Corrective Action(s): None Required.

Trap Name: **Audio Error Raise Trap**

MIB Numbers: 44

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Channel Number: [Value 3]
Trap Module Trap ID: [Value 4]

Description: This trap is issued when the system detects a bad audio signal to an encoder.
NOTE: The system can detect this condition only for digital input.

Corrective Action(s): Check that the audio input signal type and respective provisioning match.

Trap Name: **Audio Error Clear Trap**
MIB Numbers: 45
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap ID: [Value 3]
Description: This trap is issued when a previously reported bad audio signal error is cleared.
Corrective Action(s): None Required.

Trap Name: **Authorization Key Invalid Raise Trap**
MIB Numbers: 46
Variables: Trap Count Number: [Value 1]
Description: This trap is issued when an invalid authorization key is entered.
Corrective Action(s):
1 Verify your authorization key and re-enter it into the system.
2 Contact your sales representative to verify or purchase (if necessary) an authorization key.
3 Enter the authorization key.

Trap Name: **Authorization Key Invalid Clear Trap**
MIB Numbers: 47
Variables: Trap Count Number: [Value 1]
Trap Cleared Trap Counter: [Value 2]
Description: This trap is issued when a valid authorization key is entered to correct an invalid key.
Corrective Action(s): None Required.

Trap Name: **Unauthorized Feature Raise Trap**
MIB Numbers: 48
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Channel Number: [Value 3]
Trap Module Trap ID: [Value 4]
Description: This trap is issued when a board is provisioned for an unauthorized key-enabled feature.
Corrective Action(s):
1 Disable the unauthorized feature.
2 If you think that this feature is supposed to be authorized, verify your authorization key and re-enter it into the system.
3 Otherwise, contact your sales representative to purchase an authorization key.
4 Enter the authorization key.
5 Activate the authorized feature.

Trap Name: **Unauthorized Feature Clear Trap**
MIB Numbers: 49
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap ID: [Value 3]
Description: This trap is issued when provisioning for an unauthorized, key-enabled feature is corrected.
Corrective Action(s): None Required.

Trap Name: **System PID Conflict Raise Trap**
MIB Numbers: 50
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Port Number: [Value 3]
Trap Module Trap ID: [Value 4]
Description: This trap is issued when a board detects a PID conflict on a trunk.
Corrective Action(s): 1 Check PID settings.

Trap Name: **System PID Conflict Clear Trap**
MIB Numbers: 51
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap Counter: [Value 3]
Description: This trap is issued when a previously detected pid conflict is cleared.
Corrective Action(s): None Required.

Trap Name: **Transport Stream Loss of Signal Raise Trap**
MIB Numbers: 52
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Port Number: [Value 3]
Trap Module Trap ID: [Value 4]
Description: This trap is issued when an the Transport Stream Importer (TSI-100) module detects a loss of signal on an incoming transport stream.
Corrective Action(s): 1 Check the Ethernet connection to the TSI-IO-STD card if the service is provided to the system over UDP.
2 Check the ASI connection to the TSI-IO-STD if the service is provided to the system over ASI.
3 Check the video source equipment.

Trap Name: **Transport Stream Loss of Signal Clear Trap**
MIB Numbers: 53
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap Counter: [Value 3]
Description: This trap is issued when a previously detected transport stream loss of signal is cleared.
Corrective Action(s): None Required.

Trap Name: **Transport Stream Loss of Synchronization Raise Trap**
MIB Numbers: 54
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Port Number: [Value 3]
Trap Module Trap ID: [Value 4]
Description: This trap is issued when an importer board loses synchronization on an incoming transport stream.
Corrective Action(s): 1 Check the TSI-IO-STD's input connections.
2 Check the video source equipment.

Trap Name: **Transport Stream Loss of Synchronization Clear Trap**
MIB Numbers: 55
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap Counter: [Value 3]
Description: This trap is issued when an importer board recovers synchronization on an incoming transport stream.
Corrective Action(s): None Required.

Trap Name: **Transport Stream Continuity Count Error Raise Trap**
MIB Numbers: 56
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Port Number: [Value 3]
Trap Module Trap ID: [Value 4]
Description: This trap is issued when an importer board detects continuity errors in an incoming transport stream.
Corrective Action(s): Check the video source equipment.

Trap Name: **Transport Stream Continuity Count Error Clear Trap**
MIB Numbers: 57
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap Counter: [Value 3]
Description: This trap is issued when a previously detected continuity error condition is corrected.
Corrective Action(s): None Required.

Trap Name: **Transport Stream Bit Error Raise Trap**
MIB Numbers: 58
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Port Number: [Value 3]
Trap Module Trap ID: [Value 4]
Description: This trap is issued when an importer board detects bit errors in an incoming transport stream.
Corrective Action(s): Check the video source equipment.

Trap Name: **Transport Stream Bit Error Clear Trap**
MIB Numbers: 59
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap Counter: [Value 3]
Description: This trap is issued when a previously detected bit error condition is corrected.
Corrective Action(s): None Required.

Trap Name: **Transport Stream Bandwidth Error Raise Trap**
MIB Numbers: 60

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Port Number: [Value 3]
Trap Module Trap ID: [Value 4]

Description: This trap is issued when the provisioned bandwidth is exceeded for imported programs.

Corrective Action(s): Do one of the following:

1 Increase this program's Total Bitrate (in the Program Output Properties dialog) to accommodate the imported program.
2 Decrease the imported program's output to accommodate this program's Total Bitrate.

Trap Name: **Transport Stream Bandwidth Error Clear Trap**

MIB Numbers: 61

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap Counter: [Value 2]

Description: This trap is issued when a previously detected bandwidth exceeded condition is cleared.

Corrective Action(s): None Required.

Trap Name: **Transport Stream Service Error Raise Trap**

MIB Numbers: 62

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Port Number: [Value 3]
Trap Module Trap ID: [Value 4]

Description: This trap is issued when at one or more of the imported services cannot be found or does not exist.

Corrective Action(s):

1 Check the input connections to the TS-IO-STD.
2 Check configuration.
3 Check the source.

Trap Name: **Transport Stream Service Error Clear Trap**

MIB Numbers: 63

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Cleared Trap Counter: [Value 3]

Description: This trap is issued when a previously detected service error condition is corrected.

Corrective Action(s): None Required.

Trap Name: **Ethernet Bandwidth Error Raise Trap**

MIB Numbers: 64

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Trap Module Trap ID: [Value 3]

Description: This trap is issued when Ethernet traffic entering the TSI-IO-STD causes Ethernet packets to be dropped.

Corrective Action(s): None Required.

Trap Name:	**Ethernet Bandwidth Error Clear Trap**
MIB Numbers:	65
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Trap Cleared Trap Counter: [Value 3]
Description:	This trap is issued when a previously detected ethernet bandwidth error condition is cleared.
Corrective Action(s):	None Required.

Volume 4: Appendices

Chapter 30: Selenio Status Monitoring

Status Tree, Display, and Dialogs

30

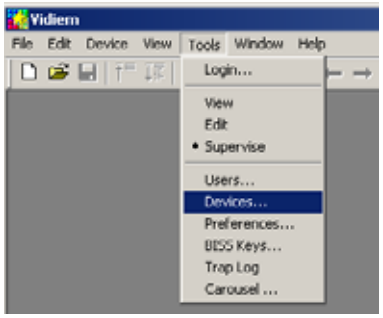
30.1 Overview of Selenio Status Monitoring

Vidiem™'s Status Document Window provides real-time status monitoring of any device registered by the Vidiem™ Management System. This window is divided into two parts, (a) the status tree, and (b) the status display. For Selenio:

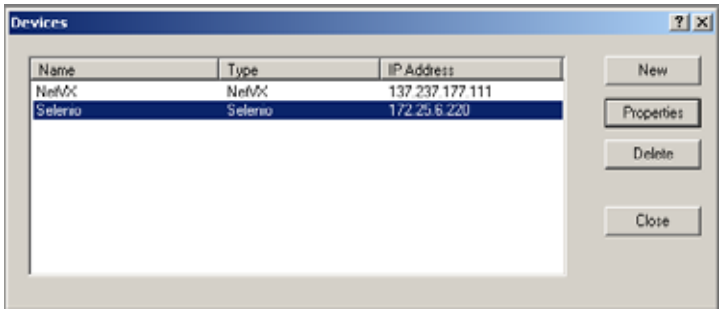
- Use the "Configuring a Selenio Device for Status Display in Vidiem" on page 621 for information on how to configure a Selenio device to monitor status in Vidiem.
- Click "Status Display Navigation Tree" on page 622 in the left pane to view status options.
- See "Overview of the Selenio Status Display in Vidiem" on page 623 for details on Selenio Status options.

30.2 Configuring a Selenio Device for Status Display in Vidiem

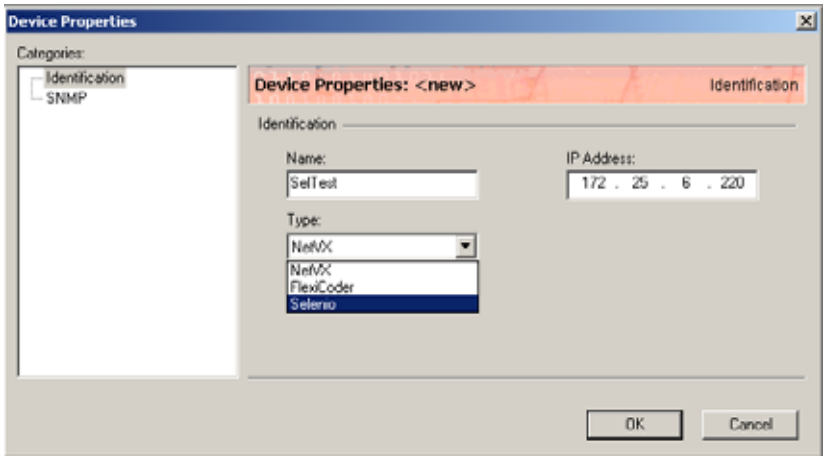
You can configure a Selenio device for monitoring by going to **Tools > Devices**.



In the Devices dialog, click **New**.



in the **Device Properties** dialog, provide the **IP Address** of the Selenio device to monitor, select **Type** as **Selenio**, and provide a **Name**. Click **OK**.



30.3 Status Display Navigation Tree

The status display provides a navigation tree populated with one main branch for each device listed in the Devices Dialog. Place a check mark in the box at the highest level of the tree to monitor a given device. When monitoring a Selenio, the alarm status icon next to the device name indicates the highest severity-level alarm currently affecting that device.

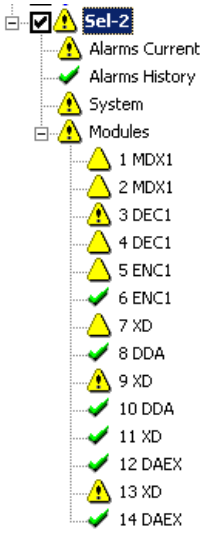


Figure 30-1 The Selenio Status Tree

Status icons at each level of the tree indicate the highest severity-level alarm affecting each branch.

30.4 Status Navigation Tree Icons

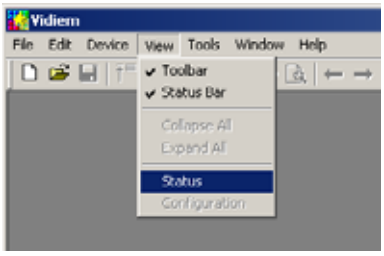
The Status Navigation tree displays the following Alarm Status Icons. Icons are listed by severity level ranging from most to least severe.

Icon	Icon Meaning
.	Indicates the device or module reports at least one critical error.
.	Indicates the device or module reports at least one major error.
.	Indicates the device or module reports at least one minor error.
.	Indicates the device or module provided a warning message.
.	Indicates the device or module did not report any errors.
.	Indicates Vidiem™ cannot display status for this device or module.

30.5 Overview of the Selenio Status Display in Vidiem

You can monitor status for a configured Device by selecting **View > Status**.

.

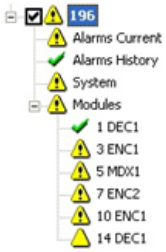


The Status Display provides a composite, graphical representation of Selenio.

Figure 30-2 Selenio Status Display

The Status Page provides a tree view with status info for Selenio. The Selenio tree expands into:

- Alarms Current
- Alarms History
- System
- Modules



30.5.0.1 Alarms Current

Alarms Current provides a listing of the current Selenio alarms.

30.5.0.2 Alarms History

Alarms History provides a Selenio alarm log view.

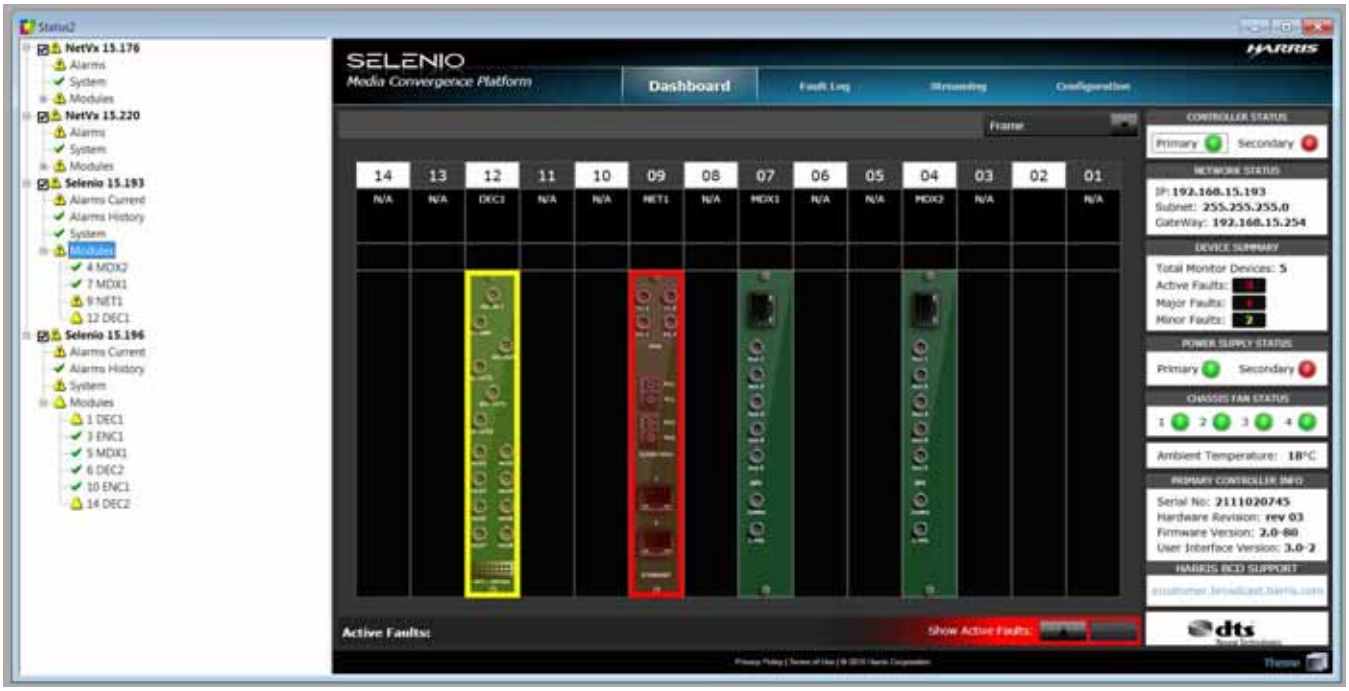
30.5.0.3 System

Clicking System provides a complete overview of the Selenio system. The Selenio System Explorer opens up in the right pange and displays frame modules and the frame control panel.

SELENIO
Media Convergence Platform
Configuration
Frame - Controller
Slot 04 - MDX2
Slot 07 - MDX1
Slot 09 - NET1
Slot 12 - DEC1
Configuration
Faults
Sort All By Active
Show All
ID
Fault Name
Error Level
Enable/Disable
Priority
1 Ambient temperature high Major Disable 6
2 Temperature of the controller out of range Major Disable 6
3 Primary power supply fault Major Disable 6
4 Secondary power supply fault Major Disable 6
5 Voltage of the controller out of range Major Disable 6
6 Fan 1 fault Major Disable 6
7 Fan 2 fault Major Disable 6
8 Fan 3 fault Major Disable 6
9 Fan 4 fault Major Disable 6
10 Module input fault Major Disable 6
Frame - Controller Presets
System Presets
Edit
Refresh
All Module Presets

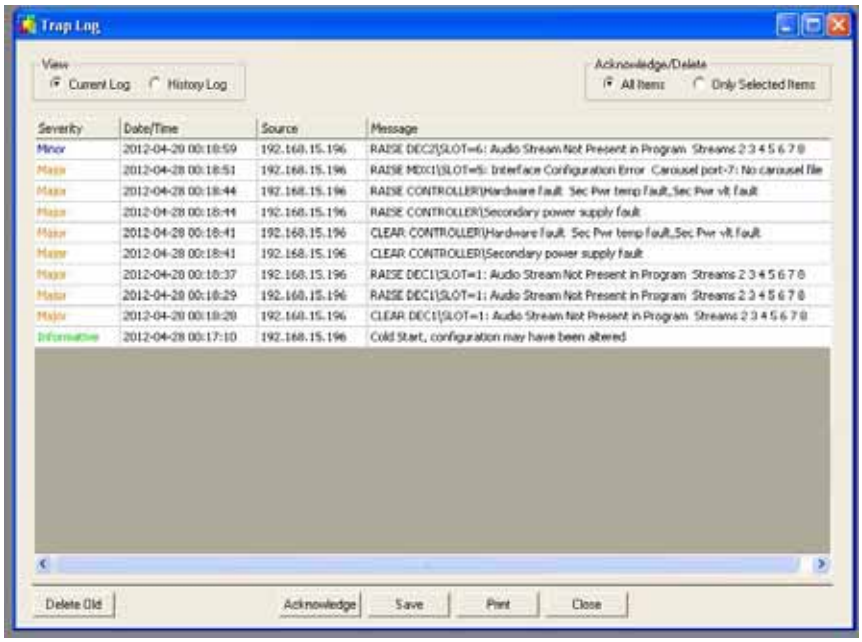
30.5.0.4 Modules

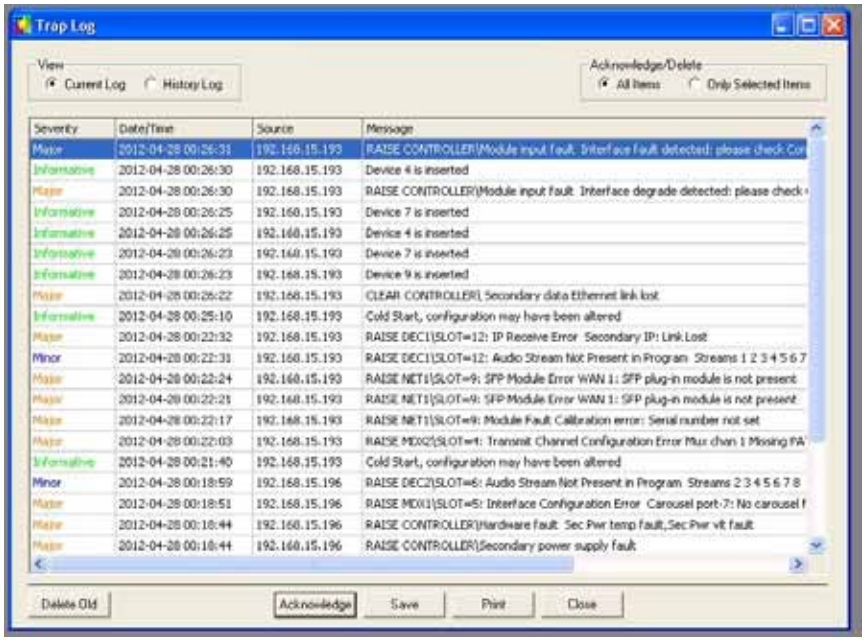
Modules expand to display each slot that has a module installed (listed in slot order). Each branch has a yellow or red icon to indicate minor or major faults at that level. Click on an item in the status tree to have the relevant web page open in the right pane. For example, if you click Modules and the click on one of the available modules, the right pane will lauch the Selenio interface, and show properties and navigation for the module clicked on.



. 30.5.1 Selenio Traps

Go to **Tools > Trap** Log to open up the Trap Log. You can choose to view the current log or the history log. Items can be sorted by severity, date/time, source, and message.


Trap Log
View
Current Log
History Log
Acknowledge/Delete
All Items
Only Selected Items
Severity
Date/Time
Source
Message
Minor 2012-04-28 00:18:59 192.168.15.196 RAISE DEC2\SLOT=6: Audio Stream Not Present in Program Streams 2 3 4 5 6 7 8
Major 2012-04-28 00:18:51 192.168.15.196 RAISE MDX1\SLOT=5: Interface Configuration Error Carousel port-7: No carousel file
Major 2012-04-28 00:18:44 192.168.15.196 RAISE CONTROLLER\Hardware fault Sec Pwr temp fault,Sec Pwr vlt fault
Major 2012-04-28 00:18:44 192.168.15.196 RAISE CONTROLLER\Secondary power supply fault
Major 2012-04-28 00:18:41 192.168.15.196 CLEAR CONTROLLER\Hardware fault Sec Pwr temp fault,Sec Pwr vlt fault
Major 2012-04-28 00:18:41 192.168.15.196 CLEAR CONTROLLER\Secondary power supply fault
Major 2012-04-28 00:18:37 192.168.15.196 RAISE DEC1\SLOT=1: Audio Stream Not Present in Program Streams 2 3 4 5 6 7 8
Major 2012-04-28 00:18:29 192.168.15.196 RAISE DEC1\SLOT=1: Audio Stream Not Present in Program Streams 2 3 4 5 6 7 8
Major 2012-04-28 00:18:20 192.168.15.196 CLEAR DEC1\SLOT=1: Audio Stream Not Present in Program Streams 2 3 4 5 6 7 8
Informative 2012-04-28 00:17:10 192.168.15.196 Cold Start, configuration may have been altered
Delete Old
Acknowledge
Save
Print
Close


Trap Log
View
Current Log
History Log
Acknowledge/Delete
All Items
Only Selected Items
Severity
Date/Time
Source
Message
Major 2012-04-28 00:26:31 192.168.15.193 RAISE CONTROLLER\Module input fault: Interface fault detected: please check Cor
Informative 2012-04-28 00:26:30 192.168.15.193 Device 4 is inserted
Major 2012-04-28 00:26:30 192.168.15.193 RAISE CONTROLLER\Module input fault: Interface degrade detected: please check
Informative 2012-04-28 00:26:25 192.168.15.193 Device 7 is inserted
Informative 2012-04-28 00:26:25 192.168.15.193 Device 4 is inserted
Informative 2012-04-28 00:26:23 192.168.15.193 Device 7 is inserted
Informative 2012-04-28 00:26:23 192.168.15.193 Device 9 is inserted
Major 2012-04-28 00:26:22 192.168.15.193 CLEAR CONTROLLER\ Secondary data Ethernet link lost
Informative 2012-04-28 00:25:10 192.168.15.193 Cold Start, configuration may have been altered
Major 2012-04-28 00:22:32 192.168.15.193 RAISE DEC1\SLOT=12: IP Receive Error Secondary IP: Link Lost
Minor 2012-04-28 00:22:31 192.168.15.193 RAISE DEC1\SLOT=12: Audio Stream Not Present in Program Streams 1 2 3 4 5 6 7
Major 2012-04-28 00:22:24 192.168.15.193 RAISE NET1\SLOT=9: SFP Module Error WAN 1: SFP plug-in module is not present
Major 2012-04-28 00:22:21 192.168.15.193 RAISE NET1\SLOT=9: SFP Module Error WAN 1: SFP plug-in module is not present
Major 2012-04-28 00:22:17 192.168.15.193 RAISE NET1\SLOT=9: Module Fault Calibration error: Serial number not set
Major 2012-04-28 00:22:03 192.168.15.193 RAISE MDX2\SLOT=4: Transmit Channel Configuration Error Mux chan 1 Missing PA
Informative 2012-04-28 00:21:40 192.168.15.193 Cold Start, configuration may have been altered
Minor 2012-04-28 00:18:59 192.168.15.196 RAISE DEC2\SLOT=6: Audio Stream Not Present in Program Streams 2 3 4 5 6 7 8
Major 2012-04-28 00:18:51 192.168.15.196 RAISE MDX1\SLOT=5: Interface Configuration Error Carousel port-7: No carousel f
Major 2012-04-28 00:18:44 192.168.15.196 RAISE CONTROLLER\Hardware fault Sec Pwr temp fault,Sec Pwr vlt fault
Major 2012-04-28 00:18:44 192.168.15.196 RAISE CONTROLLER\Secondary power supply fault
Delete Old
Acknowledge
Save
Print
Close

For help on Selenio traps, refer to the help file on the Selenio system.

Appendix A: Release Notes

A

A.1 Known Issues

Be sure to review the Product Release Description (PRD) for your NetVX Video Networking System, or FlexiCoder Digital Video System firmware. The PRD (sometimes named README) is included on the firmware distribution CD and provides important, last-minute information concerning system operation and performance.

A.1.1 Vidiem™ 2.3.1 Help System

NetVX Help Only

While every effort is made to keep this help system up to date, some descriptions of the configuration options, ranges, and selections (collectively 'items') may contain the statement 'Available in a future release' indicating that an item is not available. However the item may actually be available. Similarly, some descriptions may not contain this statement, and the item may not be available. If a discrepancy is suspected, please consult the documentation for the analogous craft port command in the 'NetVX Video Networking System Release #.# Reference Manual'. This document is contained in the file 'pdf' on the firmware CD. If this information is critical, and the craft port documentation is unfamiliar to you, then please contact technical support.

A.1.2 Issue Regarding the LDV EMS 1.2.0 Uninstaller

⚠ WARNING!

Warning: Do not uninstall LDV EMS version 1.2.0 using its uninstaller!

When upgrading from LDV EMS Version 1.2.0 to Release 4.1.1, select the 'Remove LDV EMS (recommended)' option when prompted

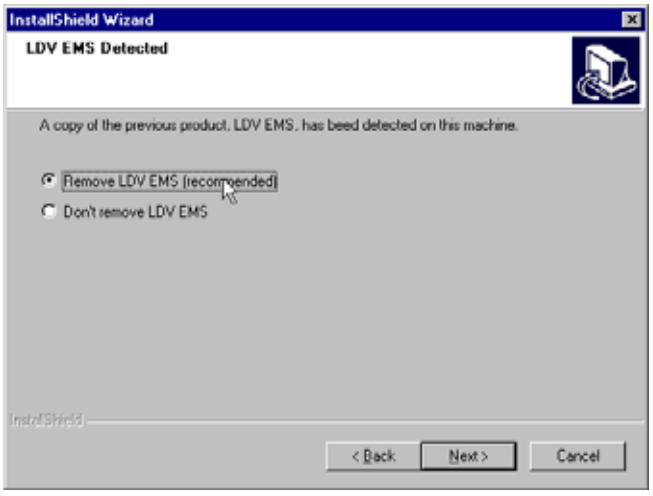

InstallShield Wizard
LDV EMS Detected
A copy of the previous product, LDV EMS, has been detected on this machine.
Remove LDV EMS (recommended)
Don't remove LDV EMS
InstallShield
< Back
Next >
Cancel

Figure A-1 Recommended Uninstall Procedure for LDV EMS 1.2.0

This selection ensures that the LDV EMS 1.2.0 is properly Uninstall and important system files remain intact.

A.1.3 vnet011179 - PDH and SONET System Errors

Condition

ATM 'Input Type' is set to 'NONE' in the ATM network Properties dialog.

Behavior

The 'Status View' attributes transmitted cell counts to the SONET interface regardless of whether the actual interface used is SONET or PDH.

Workaround

None

A.1.4 vnet010731 - Mode Switching TS to ATM; or ATM to TS

Condition

Use the Vidiem™ Element Management System to switch the Digital Video System's operational mode from Transport to ATM, or from ATM to Transport.

Behavior

- After switching from ATM to Transport Stream mode, the Vidiem™ Element Management System allows identical PSI Program values to be assigned to more than one program.
- After switching from Transport Stream to ATM mode, the Vidiem™ Element Management System allows identical VCI values to be assigned to more than one program.

Workaround

- After switching from ATM to Transport Stream mode, the PSI Program number must be made unique for each program.
- After switching from Transport Stream mode to ATM mode, the VCI number for each program must be made unique.

A.1.5 vnet011179 - Erroneous ATM Output Errors and Counts

Condition

Any ATM PDH I/O card installed behind the NIM-100 as the system's main I/O interface.

Behavior

Errors are attributed to both SONET and PDH interfaces when only one such interface is installed and actually being used. The cells transmitted and ATM error readings provided to the Vidiem™ Element Management System are not distinguished by interface.

Workaround

Be aware of the interface type (SONET or PDH) used on your system and use the appropriate tab when monitoring status.

Appendix B: NetVX Firmware Upgrade Procedure

B

B.1 Purpose

The NetVX is shipped from the factory pre-loaded with the latest available firmware. This procedure explains how to upgrade the NetVX's firmware to a later version.

- Use the "Upgrade.exe" utility to copy new firmware files on to the NetVX.
  The "Upgrade.exe" utility is included on the NetVX firmware installation CD.
- Use either the Vidiem™ Element Management System or the craft port/telnet interface to cause the NetVX to cut over and begin using the new firmware.

Prerequisites

- The NetVX targeted for upgrade must be configured with an IP address. See Section 1.10, "How to Set the NetVX IP Address" on page 38 for instructions.
- The PC used to run Upgrade.exe must have IP connectivity (usually over Ethernet) to the NetVX.
- Microsoft Internet Explorer (IE) 5.0 or higher must be installed on the PC used to run the Upgrade.exe utility. IE 5.5 is required for full functionality.
- When upgrading a NetVX that uses a redundant system controller module, the system controller in slot 1 must be the active system controller. Additional steps required to perform a non-service affecting upgrade are provided in the following sections.
  - Section B.4, "Step III: Using Vidiem – Final Upgrade Steps for Dual-System Controller Systems" on page 635.
  - Section B.6, "Step III: Using the Craft Port – Final Upgrade Steps for Dual-System Controller Systems" on page 637.

If using the Vidiem™ Element Management System...

- Vidiem™ Element Management System 2.1 or later must be installed on a PC with IP access to the target NetVX.
- The Vidiem™ Element Management System's device list must contain an entry for the target NetVX. See the Vidiem™ Element Management System's online help topic "How to Add a Device to the Device List" if you need assistance.

B.2 Step I: Clear Space and Use Upgrade.exe to Copy New Firmware

The NetVX has limited space for firmware loads. Use the next couple steps to ensure the system has sufficient space for the firmware you are about to load.

1. In the Vidiem™ Element Management System, open the target NetVX and read its settings. Read the system's settings by either "Device > Read" from the menubar, or by pressing the "Read Device" button in the toolbar.
2. In the navigation tree, select "Utilities + (right click) Properties > Firmware" to open the Firmware dialog.

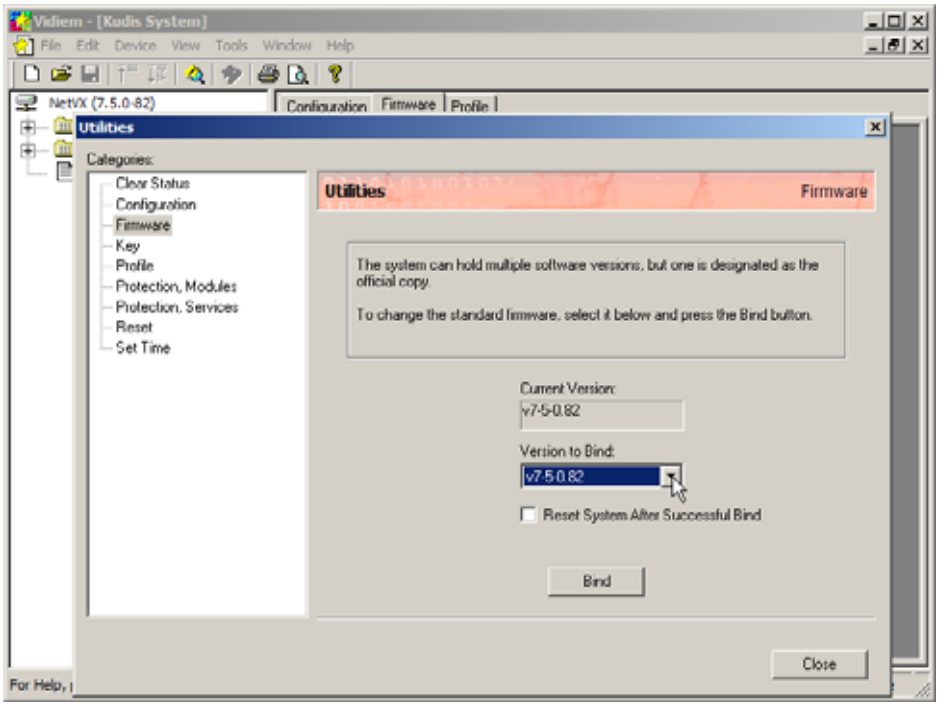


Figure B-1 Utilities Firmware Dialog

3. In the Firmware dialog, note the 'Current Version' and select the exact same version in the 'Version to Bind' drop down.
4. Click the 'Bind' button to bind the system to this version of firmware. This step also causes the system to delete all non-'current' and non-'previous' versions of firmware thereby ensuring sufficient space to load firmware (as directed in the next steps).

The 'Upgrade.exe' utility copies firmware from the release CD to the NetVX system.

5. Put the NetVX firmware installation CD in the PC CD ROM drive.
6. Double-click the "Upgrade.exe" program located at the root of the CD directory.

```
D:\Upgrade.exe
```

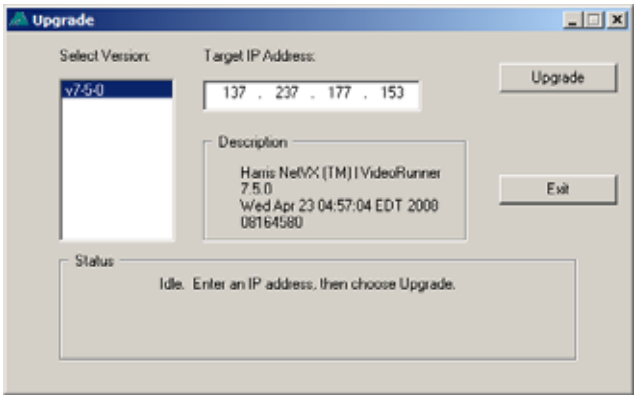


Figure B-2 Upgrade Utility Screen

7. Select the firmware version to load onto the NetVX from the 'Select Version' list on the left side of the utility.

8 Enter the NetVX's IP address in the space provided.

9 Press the "Upgrade" button
A login dialog is presented if either the NetVX's default username or password were changed. If this happens, enter the new login and/or password to complete

The upgrade procedure may be completed using either the Vidiem™ Element Management System, or the craft port interface. Instructions for both interfaces are included in the sections listed below.

- Section B.3, "Step II: Using Vidiem – Activate the New Firmware on the System Controller" on page 634.
- Section B.5, "Step II: Using the Craft Port – Activate the New Firmware" on page 637.

B.3 Step II: Using Vidiem – Activate the New Firmware on the System Controller

1 In the Vidiem™ Element Management System, open the target NetVX and read its settings. Read the system's settings by either "Device > Read" from the menubar, or by pressing the "Read Device" button in the toolbar.

2 In the navigation tree, select "Utilities + (right click) Properties > Firmware" to open the Firmware dialog.

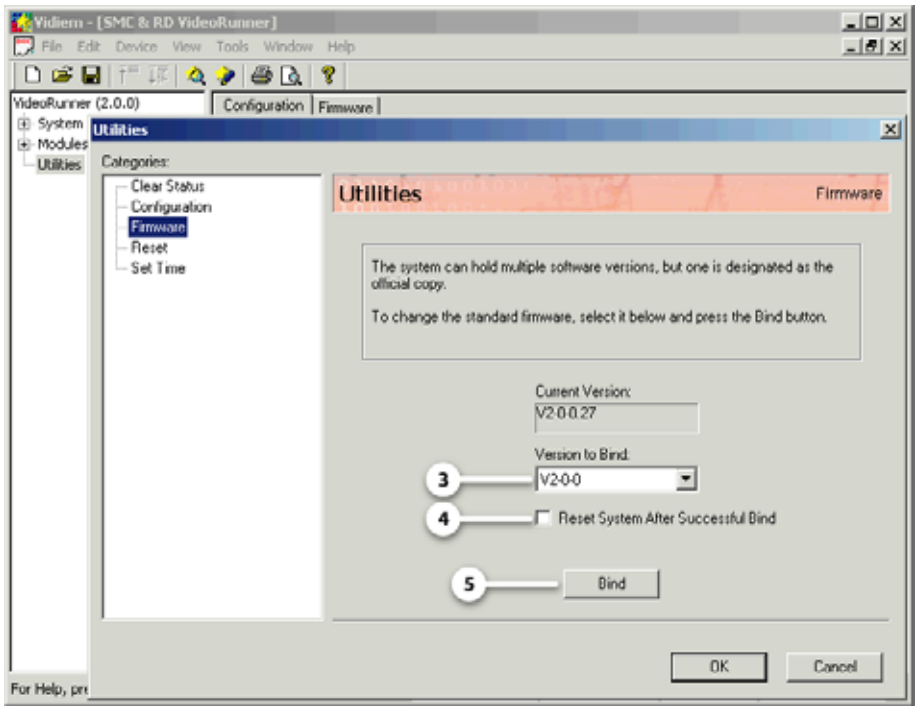


Figure B-3 Utilities Firmware Dialog

3 In the Firmware dialog, select the new firmware release in the "Version to Bind" drop down (item 3 in figure). Use the appropriate step below for your system.

3a Service-Affecting Upgrade – Systems with one or two *System Controllers...
Check the "Reset System After Successful Bind" checkbox (item 4) to cause the System Controller to reset immediately after it has bound itself to the selected version of firmware. This approach results in a one or two minute interruption in service while the system controller(s) and application modules upgrade.

3b Non-Service-Affecting Upgrade – Requires a system with two System Controllers...
DO NOT check the "Reset System After Successful Bind" checkbox.

Note: Although the firmware upgrade to the system controller(s) are non service-affecting, application modules will require a reset to load the new firmware. The application module reset will affect service unless the module has a backup.

---

4 Click the "Bind" button (item 5 in Figure B-3). NetVX verifies this new version of firmware and...

- In the unlikely event that the firmware failed verification, an error message is issued.
- If the "Reset System After Successful Bind" checkbox (described in Step 3a above) is checked, the system resets and begins using the new firmware to which it is bound. Use this option if you do not mind a brief interruption in service while the system and its peripheral modules reset.
- If the "Reset System After Successful Bind" checkbox is not checked, the system simply remains bound to the new firmware, **but continues using the existing, loaded, and active firmware until a manual reset or power cycle occurs**. Use this option if you intend to perform a non-service-affecting upgrade on s system with more than one system controller.

The completion of step 4 above concludes the upgrade procedure for any system with a single system controller. Follow the procedures in the next section to complete a non-service-affecting upgrade on systems with redundant system controllers.

B.4 Step III: Using Vidiem – Final Upgrade Steps for Dual-System Controller Systems

Reset the Backup System Controller

1 In the “Utilities” branch of the main navigation tree, click the “Reset” branch to open the “Reset” dialog.

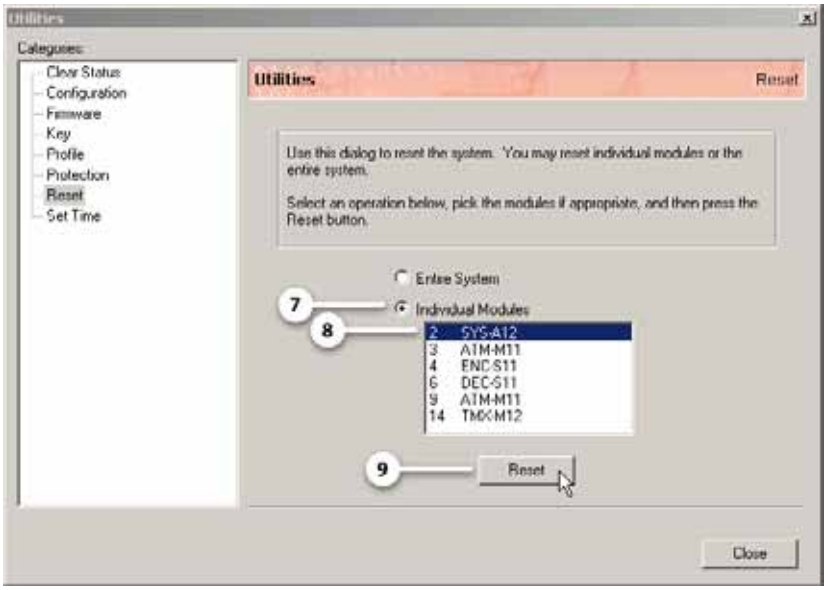


Figure B-4 Utilities Reset Dialog

2 In the “Reset” dialog, select the “Individual Modules” option (item 7 in Figure B-4)

3 Select the entry “2 SYS-A12” for the System Controller in slot 2 (item 8 in Figure B-4).

4 Press the “Reset” button (item 9 in Figure B-4) to immediately reset the secondary System Controller. After the secondary System Controller reboots, it retrieves the new firmware, which was just loaded and bound, from the Primary System Controller in slot 1.

Transfer Control to the Backup System Controller

5 Click the “Protection” branch to open the “Protection” dialog.

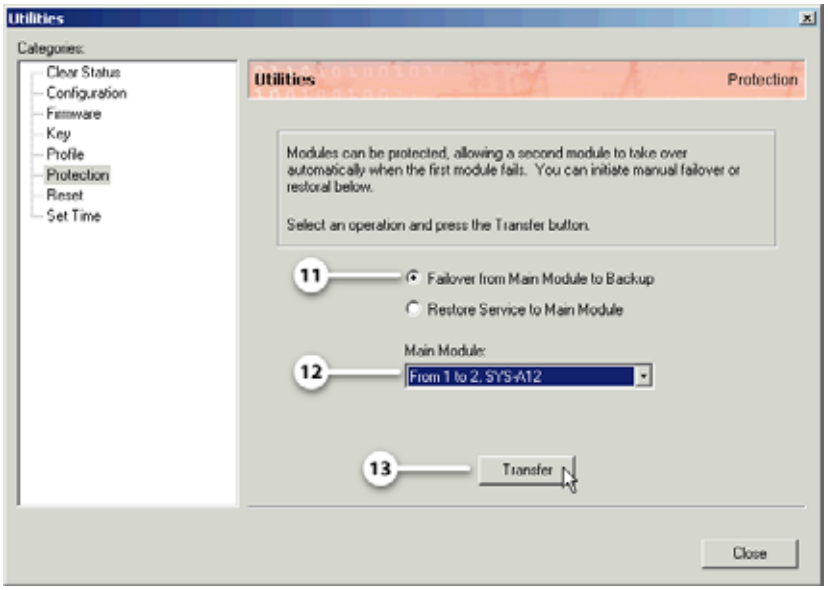


Figure B-5 Utilities Protection Dialog

6 Choose the “Failover from Main Module to Backup” option (item 11 in Figure B-5).

7 Choose “From 1 to 2 SYS-A12” (item 12 in Figure B-5).

8 Click the “Transfer” button to transfer system control from slot 1 to slot 2. The backup SYS-A12 is now in control and running the new firmware.

Reset the Main System Controller to Upgrade Its Firmware

9 Repeat steps 1 through 4 of this procedure, but in step 3, target the System Controller in slot “1 SYS-A12” for reset. The main SYS-A12 module is now running the new firmware but it is not in control of the system.

Transfer Control Back to the Main System Controller

10 Repeat steps 6 through 8, but choose the option to failover “From 2 to 1 SYS-A12” instead.

At this point the System Controller module in slot 1 should be active and running the system using the new firmware loaded at the beginning of this procedure.

Both system controllers are now running the new firmware.

Upgrade the System’s Application Modules

At this point the system’s application modules are still running the previous version of firmware.

In order to complete a wholly non service-affecting upgrade, each application module must have a backup module; if this is the case then proceed to step 11 below to complete the non service-affecting upgrade.

If backup modules are not available for all application modules, then a system reset should be performed during a system maintenance window to load the new firmware on all application modules.

11 Repeat the above steps for each type of the system’s application modules; these modules must be reset before the new firmware is loaded and operates on them.

- Reset the backup module.
- Transfer the service from the main module to the backup module.
- Reset the main module.
- Transfer the service from the backup module back to the main module.

B.5 Step II: Using the Craft Port – Activate the New Firmware

Use the following steps to bind and activate firmware using the craft port interface.

1. Specify the version of firmware the system should use.

   ```
   util firmware #.#.#
   ```

2. Use the appropriate step below for your system.

   2a [Service-Affecting Upgrade]
   Systems with one System Controller...
   Use the following command to reset the main system controller to upgrade the system to the selected version of firmware. This approach results in a one or two minute interruption in service while the system controller and application modules upgrade. This steps concludes the upgrade procedures for systems with a single system controller.

   ```
   util reset slot.1
   ```

   2b [Non-Service-Affecting Upgrade]
   Systems with two System Controllers...
   Follow the steps in the next section Section B.6, "Step III: Using the Craft Port – Final Upgrade Steps for Dual-System Controller Systems" on page 637.

B.6 Step III: Using the Craft Port – Final Upgrade Steps for Dual-System Controller Systems

1. Reset the backup system controller.

   ```
   util reset slot.2
   ```

2. Wait 45–60 seconds for the backup system controller to fully reset. When the reset is completed, the backup system controller begins using the new firmware.
3. Transfer the service from the main system controller to the backup system controller.

   ```
   util failover slot.1
   ```

4. Reset the main system controller.

   ```
   util reset slot.1
   ```

5. Wait 45–60 seconds for the main system controller to fully reset. When the reset is completed, the main system controller is then operating using the new firmware.
6. Transfer the service from the backup system controller to the main system controller.

   ```
   util failback slot.2
   ```

7. Repeat the above steps for each type of the system's application modules; these modules must be reset before the new firmware is loaded and operates on them.
   - Reset the backup module.
   - Transfer the service from the main module to the backup module.
   - Reset the main module.
   - Transfer the service from the backup module back to the main module.

B.7 How to Change the Current Active Firmware

Note: This procedure requires that you've loaded new firmware on the system. See "Appendix B: NetVX Firmware Upgrade Procedure" on page 631 for details on loading firmware.

1. Open the 'Firmware' dialog.
   - Double-click on the 'Utilities' branch of the configuration tree.
   - Click 'Firmware' in the sub-navigation tree.
2. Select a new firmware version from the 'Version to Bind' drop down list.
3. Check the 'Reset System After Successful Bind' check box if you want the selected firmware to become the active at the end of this procedure.
4. Press the 'Bind' button.

The system queues the selected firmware to become active upon the next system reset or power cycle. However, if you checked the 'Reset System After Successful Bind' checkbox in Step 4, then the system resets itself and immediately begins using the new firmware.

Related Dialog

"Config > Utilities > Firmware Dialog" on page 465

Related Procedures

"Appendix B: NetVX Firmware Upgrade Procedure" on page 631